Stock Return Synchronicity, Earnings Informativeness, and Institutional Development: Evidence from African Markets

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Abstract

This thesis contains the outcome of three separate but interrelated empirical analyses on stock return synchronicity, earnings informativeness and institutional development in a sample of African markets.

The first analysis investigates the level and determinants of stock return synchronicity. Some recent studies have provided a theoretical argument that contrary to conventional wisdom, stock return synchronicity can be high in a strong information environment as market participants are less surprised about the occurrence of future events arising out of having more available information. This may therefore imply that stock return synchronicity can be conversely low in a relatively weaker information environment. The first empirical analysis of the thesis tests this conjecture using a total of 616 firms across five African countries (Botswana, Ghana, Kenya, Nigeria and South Africa) over the 2005-2015 period. The main measure of stock return synchronicity used is the R^2 from a market model regression of individual stock returns on the returns of a corresponding market index. The findings show that on average, firms in African markets do not exhibit high levels of stock return synchronicity, providing support for the view that stock return synchronicity can be low in markets with relatively weak transparency and conversely high in strong information environments. In regression analysis, the main driver of stock return synchronicity, however, is firm size, whilst contrary to some previous studies, ownership structure has no impact. These results are robust to different measures of stock return synchronicity that include both a lagged market index and a world market index. They are also robust to different estimation techniques including Fama-Macbeth regressions and ordered probit regressions.

The second empirical analysis of this thesis investigates the informativeness of earnings announcements in African stock markets and examines whether conditional on the level of stock return synchronicity, market reactions to earnings announcements are influenced by firm fundamentals or trading frequency. This chapter uses a set of 1762 annual earnings announcements across 369 firms from three countries (Kenya, Nigeria and South Africa) over the 2005-2015 period. In univariate analysis, the main measure of earnings informativeness is Normalised Volatility, which divides volatility during a 21-day event window by volatility in a period of 120 days outside of the event window. Normalised volatility indicates that earnings announcements are informative

across the sample. The results are driven by less frequently-traded stocks (stocks which experience price changes of between 50% to 74% of trading days in the previous year), although informativeness is also present for highly traded stocks (stocks which experience price changes in at least 75% of trading days in the previous year). Informativeness manifests more clearly at announcement and in the post-announcement window, and there is little evidence of leakage. Cross-sectional tests, using regression analysis, provide evidence of an effect of both earnings fundamentals and investor behaviour on stock returns around earnings announcements.

The third and final empirical analysis examines the impact of two institutional factors— the mandatory adoption of IFRS and the perceptions of corruption, on the market reactions earnings informativeness within the same period of 2005-2015. The first part of the analysis tests whether earnings became more informative following the mandatory adoption of IFRS. This analysis is restricted to only Nigeria and South Africa as Kenya adopted the use of IFRS prior to the start of the sample period of this study. The second part of this analysis tests the impact of the perception of corruption on earnings informativeness in a sample made of firms from Kenya, Nigeria and South Africa. Both univariate and regression results show that the mandatory adoption of IFRS did not lead to significant improvement in earnings informativeness. This finding is consistent with the view that the improvement in accounting standards must be accompanied by effective mechanisms of enforcement in order to realise their capital market benefits. However, with respect to corruption, there is a significant negative impact on earnings informativeness in terms of abnormal trading volume. Overall the findings in this chapter point to the growing importance of how the institutional environment can have capital market implications for firms. Therefore, more work needs to be done to strengthen the institutional framework in order to further enhance the price-discovery process in these markets.

Dedication

To:

My dear parents, Frederick Kyiu and Mary Kyiu

Your faith in me has always motivated me to achieve greater heights. Your unrelenting prayers and love have also seen me through the difficult times.

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Chapter 1

Introduction

1.1 Background

Corporate news announcements are a major means by which firms disseminate information to investors, based on which investors form opinions and estimates about asset fundamentals (Griffin et al. 2011). The notion of market efficiency requires that stock prices should accurately impound new information about the firm when it becomes available, as this contributes to the stock pricing process. Prior studies such as Morck et al. (2000), however, argue that stock returns are highly synchronous in developing countries and less so in more developed countries. Stock return synchronicity implies that prices are driven by market and industry-wide factors as opposed to firm-specific information and corporate fundamentals. The ability (or lack thereof) of stock prices to incorporate firm information, particularly in developing markets, whether arising out of stock return synchronicity or not, has investor protection implications if investors cannot rely on the efficiency of the market.

One of the main factors which have been proposed as an explanation for the high levels of stock return synchronicity in developing countries (and by contrast low synchronicity in developed countries) is a weak information environment arising out of a lack of transparency (Jin and Myers 2006). Another argument is that weak protection of property and investor rights adversely affect how investors react to corporate information and therefore leads to lower incorporation of firm-specific information into stock prices (Morck et al. 2000). Further, generally poor corporate governance practices, which encourage the presence of controlling shareholders (Boubaker et al. 2014), and director interlocks (Khanna and Thomas 2009), could bring about reduced firm-level transparency leading to higher levels of stock return synchronicity. Another reason also may lie in different types of corporate ownership structure (eg. Brockman and Yan 2009, Gul et al. 2010, Boubaker et al. 2014). For example, Gul et al. (2010) find that firms with generally higher levels of ownership concentration tend to have a lower level of firm-specific information incorporated into their stock prices.

A recent study by Dasgupta et al. (2010), however, departs from these previous studies by arguing that stock return synchronicity can be high in more developed countries that have greater transparency. They argue that most often, stock prices react to news that has not been anticipated by the market. Hence in an improved information environment, the market is able to make predictions about future events due to the availability of

information. Consequently, when these events occur, there is little surprise and thus lower firm-specific variation. This raises an interesting debate where it can be conversely argued that, in a relatively weak information environment like African markets, the inability to accurately value firms can lead to greater information shocks from new information and can result in higher firm-specific variation, i.e. lower stock return synchronicity.

What will be the implications of the level of stock return synchronicity for African markets? Would a low level of stock return synchronicity suggest that stock prices in African markets do incorporate firm's specific information? In spite of the many studies of synchronicity in both developed and developing markets, its impact on the informativeness of specific corporate announcements has been unexplored. One of the most important sources of communication between managers and investors is the earnings report (Pevzner et al. 2015). And the relationship between earnings and stock prices is one of the cornerstones of finance and corporate governance (Gordon 1959). Equally the value of a company is the discounted value of future earnings. Indeed, in a very recent paper, Beaver et al. (2018) show that the information content of earnings has increased over time particularly from the beginning of the 21st century owing to such factors as changes in regulation and financial reporting standards. Therefore, in trying to investigate the implications of the level of stock return synchronicity in African stock markets, earnings announcements would serve as a suitable event to test how investors in these markets react to corporate information.

However, DeFond et al. (2007) argue that structural and institutional factors in a firm's information environment also affect how stock prices respond to corporate information, particularly earnings announcements. Indeed, there is a growing literature on the impact of structural and institutional factors on the market reaction to corporate earnings announcements. These studies form part of the overall literature examining the informativeness of earnings in an international context. Of particular note among these factors are: media sophistication and accounting quality (Griffin et al. 2011); investor protection (DeFond et al. 2007); and accounting standards in terms of International Financial Reporting Standards (IFRS) adoption (Landsman et al. 2012). But both Daske et al. (2008) and Landsman et al. (2012) argue that the capital market benefits of improved institutional mechanisms such as the adoption of IFRS can only be realised when there is stronger enforcement of regulations. This raises an interesting question about whether the adoption of IFRS in countries that are characterised by weak enforcement can result in greater earnings informativeness. Again, despite the large extant literature on how

institutional factors affect the informativeness of earnings, the impact of the perception of corruption has been unexplored. Corruption is a reflection of the strength of a country's economic and legal institutions (Svensson 2005). While some studies have shown that corruption can have adverse effects on such factors as economic growth and development, its impact on firm-level outcomes has been overlooked.

Based on the above premise, this study uses a sample of African markets to address three separate but interrelated issues relating to stock return synchronicity, earnings informativeness and institutional development. The first analysis examines the level of synchronicity of firms in a sample of five African countries. The chapter also investigates the particular firm-level factors that drive stock return synchronicity of individual firms. Finally, it also examines whether stock return synchronicity is influenced by ownership structure. The second analysis uses a larger set of annual earnings announcements to investigate the informativeness of corporate earnings. Having ascertained the level of stock return synchronicity in these markets, it is necessary to examine the implications for stock pricing. In other words, do stock prices actually respond to corporate information and if so, is informativeness driven by trading frequency or the fundamentals of the firm? The third and final analysis examines the impact of institutional development on earnings informativeness by focusing on the mandatory adoption of IFRS and the perception of corruption.

1.2 Motivation: Choice of markets

African markets provide a suitable and appropriate context for this study for a number of reasons. Firstly, and as already indicated earlier, the first part of this thesis attempts to test the conjecture that if stock return synchronicity can be high in more developed markets as argued by Dasgupta et al. (2010), then it can be conversely low in less developed markets. African markets therefore provide a suitable setting as these countries are amongst the underdeveloped countries in the world. This underdevelopment is manifested in a relatively weak level of transparency which primarily stems from poor disclosure practices by firms (Tsamenyi et al. 2007).

Secondly, although some African countries have developed or adopted corporate governance codes, the principles of good corporate governance remain far from being entrenched. One of the reasons for this situation is that most corporate governance codes in African countries are modelled after those of developed markets and therefore, do not

fully complement the institutional and cultural setting of the African countries that adopt them (Rossouw 2005). Moreover, phenomena such as the market for corporate control, which can serve as a disciplinary mechanism to compel managers to act in the best interest of shareholders, are virtually non-existent (Tsamenyi et al. 2007). Therefore, poor corporate governance may lead to a generally weak information environment with its consequent impact on stock return synchronicity and/or earnings informativeness.

Also, despite the existence of some regulatory framework in African countries to govern operations in financial markets, there is also a generally weak level of enforcement, owing to weak legal systems and high bureaucracy (Kaufmann et al. 2011). In most African countries, there is a lack of capacity or unwillingness by mandated institutions to enforce rules, laws and regulations (NEPAD-OECD 2009). Moreover, corruption remains a significant socio-economic threat. For example, Africa has one of the worst records in the yearly Transparency International corruption perception index surveys as countries that consistently rank at the bottom include a good number of African countries. Munisi et al. (2014) show that Africa ranks lowest in comparison to other continents in governance indicators such as the rule of law, regulatory quality and control of corruption.

The above three factors (i.e low level of transparency, poor corporate governance and weak institutional and regulatory quality) show that African markets are still developing, and are generally characterised by a weaker information environment, which makes them an exciting setting for testing the level and determinants of stock return synchronicity in less developed countries.

The fourth and final motivation for the choice of African markets is that the remaining part of this thesis is devoted to investigating the informativeness of earnings and whether earnings informativeness is influenced by fundamentals, trading frequency, as well as examining the impact of institutional development. Most tests of market efficiency in African markets have been limited to weak form tests (eg. Smith et al. 2002, Magnusson and Wydick 2002, Jefferis and Smith 2005, Smith 2008, Lagoarde-Segot and Lucey 2008, Ntim et al. 2011, Nwosu et al. 2013). There appears to be a dearth of studies that examine semi-strong efficiency either from the perspective of stock return synchronicity or the market reaction to corporate information. The few studies that test the market reaction to corporate information such as earnings have mostly relied on small samples due to challenges of data availability, (eg. Afego 2013, Kiremu et al. 2013).

However, as African markets continue to make gradual and modest improvements, and given the availability of more data, it is necessary to build a critical mass of studies that investigate the informational efficiency of African stock markets in order to demonstrate whether or not these markets can continue to be an attractive investment destination to foreign portfolio investors.

Taken all the above factors together, African markets provide an appropriate and interesting context for this study. However, in determining the specific countries that can be used as an appropriate setting for capital market research in African countries, this thesis relies on the arguments by La Porta et al. (2000) that common law countries are more market centered than civil law countries. They further argue that common law markets provide better protection of investors than civil law countries. As such, it is very likely that the cornerstone of governance in common law countries will be the stock market. The stock market will play a much more important role in the financial system. One of the main reasons they advance to support this view is that in common law countries, judges make decisions based on precedents, and are motivated by principles on what is fair and equitable. In Civil law countries on the other hand, there is heavy reliance on codes and statutes and to the extent that people can find ways around these, they could still engage in self-dealing activities. And therefore, to provide a more appropriate setting where the market plays an important role in the financial system, this study focuses on five countries that are predominantly common law—Botswana, Ghana, Kenya, Nigeria and South Africa. It is important to mention that over time, most common law countries have become mixed, adopting elements of both civil law and other legal systems such as Islamic law. This notwithstanding, the stock market continuous to play a more dominant role in the financial system, compared to those that rely predominantly on the French or German Civil law system. The focus on these countries in the study is also partly motivated by the availability of the relevant data. Moreover, five countries is considered appropriate due to the need to conduct the analyses on a country by country bases which provides a greater opportunity to draw more insights from the respective countries.

A potential concern, however, with this sample lies in the inclusion of South Africa. One may argue that South Africa is more advanced than most other countries on the continent, and may have some accounting, governance and legal similarities to more developed countries like the UK. Although the South African market is arguably the most developed of all markets in the sample and of all markets on the continent, there is also evidence to show that, like many other markets in Africa, the South African market also

has significant differences to developed markets. For example, and as will be discussed later in Chapter 2, ownership is relatively more concentrated in South Africa than in most developed countries. Also, Ntim (2009) demonstrates differences between South Africa and developed markets in terms of market capitalisation, number of listed companies, liquidity and the enforcement of regulation—differences that we find when equally comparing other African countries to more developed Western countries. Therefore, it is not out of place to include South Africa in the sample. Moreover, since most of the analyses are carried out on a country by country basis, the inclusion of South Africa will provide an opportunity to compare a more relatively developed African market with relatively less developed ones.

1.3 Research objectives, methods and findings

The first objective of this thesis is to examine the level of stock return synchronicity in a sample of African markets. The specific research questions answered are: What is the average level of stock return synchronicity among firms in each of the sample markets? Is stock return synchronicity influenced by firm size and age? Does the nature of corporate ownership also affect stock return synchronicity of firms? To answer these research questions in order to achieve the above research objective, the first empirical analyses of this thesis uses a sample of 616 firms and drawn from five African countries namely; Botswana, Ghana, Kenya, Nigeria and South Africa. The main measure of stock return synchronicity used is the R^2 from a market model regression of individual stock returns on the returns of a corresponding market index. The results reveal that, contrary to conventional wisdom, firms in African markets on average do not exhibit high levels of synchronicity, hence providing support for the argument that synchronicity can be relatively low in a poor information environment. In multivariate analysis, using OLS regressions, the findings show that the main driver of stock return synchronicity within firms and across all five countries is firm size. Larger firms are associated with greater levels of synchronicity, consistent with the arguments that they act as leading market indicators by signaling macroeconomic trends which have the potential to trigger similar aggregate markets movements (Piotroski and Roulstone 2004). Finally, no evidence is found to support the view that stock return synchronicity is influenced by ownership structure. These results are robust to different measures of stock return synchronicity and different estimation techniques including Fama Macbeth regressions and ordered probit regressions.

Based on the findings of the first empirical analysis, the second objective of this thesis is to investigate the informativeness of earnings and to determine whether given the low level of stock return synchronicity, earnings informativeness is influenced by trading frequency or the fundamentals of the firm. The specific research questions to be answered include: Do earnings announcements have any information content in African markets? Is earnings informativeness influenced by earnings characteristics? Is earnings informativeness influenced by trading frequency? This analysis uses an event study methodology to capture the information content of a set of 1762 earnings announcements from 369 firms across three out of the five countries namely: Kenya, Nigeria and South Africa. In univariate analysis, the main measure of informativeness, normalised volatility (which is explained in detail in Chapter 7), indicates that earnings are informative across the sample and trading frequency plays an important role in driving informativeness. Informativeness is more clearly manifest at the announcement and in the post-announcement window. Cross-sectional tests, using OLS regressions, also show evidence of an effect of both earnings fundamentals and some investor behaviour on stock returns around earnings announcements. Finally, and consistent with the findings in the previous chapter, synchronicity has no significant impact on earnings informativeness.

The third and final objective of this thesis is to examine the impact of two institutional factors— the mandatory adoption of IFRS and the perception of corruption on earnings informativeness. The specific research questions answered in this analysis include: Did earnings become more informative following the mandatory adoption of IFRS? Does the perception of corruption affect the informativeness of corporate earnings? The findings from this analysis show that the mandatory adoption of IFRS did not have a significant impact on the market reactions to earnings providing support for the view that enforcement of regulations will have to improve if the capital markets benefits of institutional development such as the adoption of IFRS, are to be achieved. The analysis in this chapter also provide some evidence that the perception of corruption has a negative impact on earnings informativeness in terms of abnormal trading volume. These results are robust to different measures of the corruption.

1.4 Contributions

The findings in this thesis make a number of important contributions to the literature. Firstly, the analysis on stock return synchronicity contributes to the literature on stock return synchronicity by providing evidence in further support of the theoretical arguments

of Dasgupta et al. (2010) that stock returns in developing markets, usually characterised by poor information environments, may not always fit the stereotypical view that they are synchronous. Despite investors being unable to efficiently evaluate future returns, the announcement of new information could trigger market reactions. In the absence of synchronicity, such information may provide an important avenue, perhaps the most important avenue, for investors to evaluate the appropriateness of stock prices of companies. Any investors in African stocks or who wish to invest in African stocks may find these results informative.

Secondly, the analysis on earnings informativeness extends the international literature on the market responses to earnings announcements by providing new evidence of how firms respond to value-relevant information in African markets, where studies of market efficiency have mostly focused on tests of the weak form. Further to this, the important role of liquidity is highlighted in this context. More highly traded stocks are less responsive to new earnings information, providing some support for the argument that company earnings are less important than market movements in pricing more liquid African stocks. The role of illiquidity in asset pricing in developing markets has focused on the cost of capital (Hearn and Piesse 2013) as well as the market reaction to analyst recommendations (Murg et al. 2016). This chapter attempts to extend our understanding of liquidity and earnings informativeness in developing countries using African markets.

The third empirical analysis contributes to the growing literature on how structural and institutional factors affect earnings informativeness. As mentioned earlier, a developing strand of literature documents how country-wide factors affect the informativeness of earnings including investor protection, development of technology, and earnings quality. This chapter investigates the impact of the adoption of IFRS in an African setting. Again, this analysis introduces a new institutional factor to this strand of literature i.e. the perceptions corruption. This is of particular interest as countries in the sample tend to be characterised by weaker legal and economic institutions. The literature on corruption is also extended by showing that it has implications for firm-level outcomes.

Finally, this thesis contributes to the broader literature on market efficiency and investor protection in developing countries. Financial development may follow from strong investor protection and market efficiency is of paramount importance as a mechanism for investor protection in developing markets. Markets, developing or

otherwise, will only attract investment funds if investors believe that market values reflect the value of companies and if the market is sufficiently liquid to ensure shareholders can sell their stocks cheaply and quickly. This begs the question as to whether African markets respond to new information in a similar way to more developed markets. If markets are relatively inefficient but prices do react to new information, then what determines the magnitude of such adjustments and can pattern be identified in this data? The responsiveness of markets to earnings information provides evidence of this type of information efficiency and investor protection. The results suggest that whilst earnings are informative across the sample, considerable work is needed to improve investor protection in African markets.

1.5 Structure of thesis

This thesis is organised into eight chapters. Chapter 2 provides a background of the markets that are the focus of the study. It first highlights the development and challenges of African stock markets, provides a profile of each of the countries used in this thesis, and sheds some light on the regulatory framework for information disclosure and the nature of corporate ownership in the five markets. Chapter 3 presents a review of both the theoretical and empirical work relevant to the thesis, highlighting on the key strands. Chapter 4 describes the data used in the thesis including sources and sample selection. It also gives an overview of the methods used in the analysis which are then expanded upon in the respective empirical analyses. Chapter 5 contains the first empirical analysis which examines the level of synchronicity of stocks in African markets and determines the factors that drive stock synchronicity. Chapter 6 contains the second empirical analysis which looks at the informativeness of earnings and whether given the low level of synchronicity, earnings informativeness is influenced by trading frequency or firm fundamentals. Chapter 7 contains the third and final empirical analysis which investigates whether earnings informativeness is also influenced by institutional factors including the adoption of IFRS and the perceptions of corruption. Chapter 8 concludes the thesis by presenting a summary of the main findings, implications and suggestions for future research.

Chapter 2

Overview of African Stock Markets

2.1 Introduction

This chapter aims to provide an overview of African stock markets with particular focus on the markets that are the subject of the study. It first provides a general overview of the development and challenges of African stock markets. It then provides a profile of each country used in the study, highlighting their political, economic, corporate governance, accounting and regulatory environments. The chapter also compares the five countries along these characteristics whilst reflecting on the implications of these characteristics for stock return synchronicity and/or earnings informativeness. Further, the operational and development characteristics of the five stock markets used in the study are highlighted, and trends in some major stock market indicators are also discussed. The chapter also highlights sections of relevant legislation that provide a basis for corporate information disclosure as a way of facilitating stock pricing in these markets. Finally, some light is shed on the nature of corporate ownership, based on previous studies.

2.2 Development and challenges of African stock markets

Most stock markets in Africa are relatively young having been established in the late 1980s and early 1990s, following policy shifts by respective governments to bring about financial deregulation and promote openness. The main exceptions are the Egypt and Johannesburg Stock Exchanges which were established in 1883 and 1887 respectively. Currently, there are 29 stock exchanges on the continent. Two of these are regional exchanges and represent the exchanges of a group of countries. The Bourse Régionale des Valeurs Mobilières (BRVM), located in Abidjan, Cote d' Ivoire, serves Benin, Burkina Faso, Guinea Bissau, Cote d'Ivoire, Mali, Niger and Togo, whilst the Bourse Régionale des Valeurs Mobilières d'Afrique Centrale (BVMAC) located in Libreville, serves Central African Republic, Democratic Republic of Congo, Chad, Equatorial Guinea and Gabon. The youngest stock market is the Angolan exchange, established in 2016. Thus, the last three decades have witnessed an increase in the number of stock markets from 8 in 1989 to the current number of 29.

It is important to mention that growth in capital market activity in Africa has been partly driven by regulatory changes (PWC 2017). Regulators in some African countries are beginning to require companies in specific sectors of the economy to list shares on

the domestic market. For example, in Tanzania, companies in the telecommunications sector are required to list their shares on the domestic stock markets. The rationale for this is to allow governments to be able to track revenues of these companies for the purposes of taxation and also to give citizens of the country an opportunity to own shares in these companies. This led to one of the largest Initial Public Offerings (IPOs) in the country involving Vodacom Tanzania. Mobile Telecommunications Network (MTN) also reached an agreement with the Nigerian Federal Communications Commission to take steps to list their Nigerian business on the stock market. This current trend of regulations and intervention by relevant state agencies will likely see more capital market activity over the coming years (PWC 2017).

Related to the preceding paragraph is also the requirement by financial companies in some countries to meet enhanced capital thresholds in order to safeguard the security of the financial system. This has had the effect of driving some banks and non-banking financial institutions to access equity markets. Ecobank Côte d'Ivoire and NSIA Banque Côte d'Ivoire for example, have recently raised equity capital on the BRVM to improve their capital structure in line with new capital adequacy requirements by the West African Economic and Monetary Union. In Ghana too, the central bank (Bank of Ghana) has recently increased the minimum capital requirements of banks from the local currency equivalent of $30m to the equivalent of about $100m, with banks being given a deadline of December 2018 to comply. Some banks have already signaled their intention to go to the equity markets. These trends are therefore likely to result in more IPOs and increased capital market activity.

Another important highlight of the development of stock markets on the African continent has been the establishment of the African Securities Exchanges Association (ASEA). The ASEA was set up with the purpose of helping member exchanges to develop by providing them with a platform to share information. Established it 1993, the ASEA currently has a membership of 27 stock exchanges and a two-fold mission. Firstly, it provides an avenue for cooperation, exchange of information and technical assistance. The second mission is to expedite the process of financial integration within the region so as to ensure the effective and efficient mobilisation of capital for accelerated growth on the continent. The ASEA tries to achieve its mission by (1) enhancing the visibility of member exchanges with the view to attracting capital inflows; (2) being an advocacy voice for member exchanges; (3) promoting market development among member states and (4) promoting capacity building.

Despite the above positive trends which appear to be auguring well for the growth and development of stock markets, certain factors have had, and still continue to have the potential of reducing the gains made. The first is the generally weak macroeconomic environment which serves as a barrier to growth. In particular, high levels of inflation have often diminished the confidence of both foreign and domestic investors, which makes them unwilling to invest in stock markets. High levels of volatility in the macroeconomic environment can also lead to high information asymmetry, which further discourages more investors from participating in stock market activity (Yartey and Adjasi 2007).

Further, the lack of a robust and well-organised banking system, and the high costs of doing business have also adversely affected the growth and development of stock markets on the continent. Studies such as Demirgüç-Kunt and Levine (1996) argue that there is a strong positive correlation between stock market development and the growth of the banking sector. Banks in many countries on the continent are relatively smaller in size when compared to those in developed markets. Many are also undercapitalised and are not able to finance projects with much larger financial outlays. Moreover, in some countries, the government also tends to be the largest borrower from domestic banks, which results in a crowding out of the private sector (Senadza et al. 2017). Therefore, the cost of raising funds by businesses becomes extremely high and unattractive.

Another important challenge that confronts stock markets in Africa is the low level of liquidity. A large percentage of stocks are in the hands of institutional investors who have mostly adopted a buy and hold strategy on the continent. Again, although many governments have tried over the years to privatise a lot of state-owned enterprises, there is still some amount of government ownership which helps to exacerbate the liquidity problem. As such, there is usually not very much trading activity. For example, the BRVM, until 2012, traded for only about 2 hours a day, although this has since increased to a 6 hours a day.

2.3 Country profiles of markets used in the study

Botswana

Botswana is a mid-size Southern African country with a population of just over 2 million. A former British protectorate that gained independence in 1966, the country is currently run as a presidential republic, and has had a stable political environment with democratic

elections held every 5 years. Economically, Botswana is regarded as one of the promising countries on the continent with a GDP and GDP per capita of about $14b and $6,527 respectively as at 2015, making it an upper middle-income country. It has been described as one of the fastest growing economies in the world (World Bank 2018a). The encouraging economic performance of Botswana over the past few decades has mainly been driven by the mining sector, particularly, diamonds. The reliance on this sector of the economy, however, renders the country vulnerable to international market price fluctuations (United Nations Economic Commission for Africa 2017). In spite of the economic growth, Botswana is still beset with high levels of poverty, especially in the rural areas. There is also a considerable amount of inequality of wealth distribution, which makes it difficult for increased economic growth to translate into significant reduction in poverty (World Bank 2018a).

The Accounting and auditing environment is regulated by the Companies Act 2003 and the Financial Reporting Act 2010, which set out the financial reporting and auditing requirements for all companies except exempt private companies. The Botswana Institute of Chartered Accountants (BICA), in September 2007, adopted IFRS without amendment. Prior to that, local accounting standards, set by the BICA, were used. Similarly the Financial Reporting Act 2010 requires that audits of financial statements be done according to International Standards on Auditing (ISA). The Financial Reporting Act 2010 also established the Botswana Accounting Oversight Authority (BAOA) as the new setter of Accounting and Auditing standards, which has the authority to adopt, adapt and issue new standards that are consistent with IFRS and ISA.

With respect to corruption, Botswana is generally regarded as one of the countries with the best record on the continent. The country has proactively sought to reinforce its legal and institutional framework by adequately resourcing institutions mandated to fight corruption. This reform was largely influenced by corruption scandals that occurred during the 1990s, where several high-ranking government officials were involved in the misuse of public funds (Transparency International 2014b). In 2015, Botswana was ranked as the 29th country with the least perception of corruption out of 169 countries world-wide by Transparency International. The relatively low level of corruption in Botswana has also been attributed to prevention and education programmes, procurement reform, parliamentary accountability and the general political will of the country's leaders (Jones 2017). Notwithstanding the encouraging corruption record, deeply entrenched

patronage networks, lack of transparency, and concerns over judicial independence still represent a challenge in the fight against corruption (Transparency International 2014b).

In terms of corporate governance, there had been no corporate governance code prior to 2013. But companies in Botswana had mostly adopted codes from other countries, particularly the South Africa King report on corporate governance, as several Botswanan companies had their headquarters in South Africa (Magang 2016). In 2013, the Botswana Stock Exchange (BSE) developed a Code of Best Practice on Corporate Governance by relying on some of the provisions in the corporate governance code of the Institute of Chartered Accountants of Sri Lanka and the King Report of Corporate Governance 2002. The BSE Code of Best Practice on Corporate Governance makes a number of provisions for how companies are governed in line with international best practices. These include a separation of the role of the Chairman and CEO, and a provision that the board should be chaired by non-executive directors. Motshegwa et al. (2017), however, argue that the BSE Code of Best Practice on Corporate Governance focuses too much on only the Board of Directors to the neglect of other structures of corporate governance.

The stock market of Botswana, the Botswana Stock Exchange, since its establishment in 1989, has continuously played an integral role in the enhancement of Botswana's financial system, and in particular the capital market, as a platform on which government, quasi-government institutions and the private sector can raise debt and equity capital. The Botswana Stock Exchange plays host to the most pre-eminent companies doing business in Botswana. These companies represent a range of industries from Banking and Financial Services to Wholesaling and Retailing, Tourism and Information Technology. As at 2015, there were 32 firms listed on the Botswana stock exchange.

Ghana

Ghana is a West-African country with a population of about 28 million people. It was the first African country, south of the Sahara, to gain independence from the British in 1957, although the Queen of England continued to serve as the head of state. However, the country become a Presidential Republic in 1960, when the Queen seized to be the head of state. Since then, Ghana has alternated between military and civilian governments, experiencing several *coup d etats*. The last military government, under the leadership of the Provisional National Defence Council (PNDC) began in 1981 and ended in 1992,

ushering in the 4th constitutional republic and another democratic presidential and parliamentary election. Since then, the country has enjoyed a relatively stable political environment with peaceful elections and successful transfer of power between different governments.

Ghana is currently regarded as a lower middle-income country. As at 2015, GDP and GDP per capita were $37b and $1,353.7 respectively. The country is a natural resource enriched country with substantial deposits of gold, diamond, bauxite and manganese. It also recently became an oil producing country, having discovered oil in 2007 and beginning commercial production in 2010. The commercial production of oil has since become one of the main drivers of growth of the economy. There is also a significant reliance on Agriculture, particularly the production and export of cash crops such as cocoa. One of the main challenges of the Ghanaian economy, however, is that there is a lack of value addition to natural resources as most of these are exported in their raw state, making it difficult for the country to dictate prices as a result of weak bargaining power. The manufacturing and industrial sectors are relatively undeveloped and are not well positioned to convert many raw materials into finished products for exports in order to maximise export receipts. The current government, led my Nana Akuffo Addo, in 2017, launched a One District One Factory initiative, which is expected to ensure the establishment of factories in all the administrative districts of the country. It is expected that with the gradual implementation of this initiative, the country would be able to add value to most of its natural resources to enhance export revenues. There are also high levels of poverty in most rural areas and some urban communities as well. This is largely due to inequality in the distribution of resources and poor infrastructural development.

In terms of corporate financial reporting, accounting and auditing requirements, companies in Ghana are governed by the Companies Act 1963, which outlines the preparation and publication of financial statements by companies. Specialised entities such as banks and insurance companies are additionally governed by other laws like the Banks and Specialised Deposit Taking Institutions Act 2016, and the Insurance Act 2006 respectively. The Institute of Chartered Accountants Ghana (ICAG) is empowered by law to adopt and adapt accounting standards for use by both government and corporate entities. The ICAG adopted the use of IFRS in 2007 by all public companies. Prior to that, The Ghana National Accounting Standards, prepared based on GAAP and Statement of Standard Accounting Practices (SSAP), were used.

As far as corruption and its perception are concerned, Ghana has not had a very encouraging record, as corruption continues to be very deep rooted. In 2015, the country was given a corruption perception score of 47/100 by Transparency International and was regarded as the 56th least corrupt country in the world out of a total of 169 countries. The high prevalence of corruption in Ghana has been attributed to a variety of factors including nepotism, a culture of gift-giving and selective application of sanctions (The Institute of Economic Affairs Ghana 2016). Yet the biggest cause is the poor enforcement of laws and regulations that have been enacted to prevent corrupt practices. Ghana has many good pieces of legislation meant to fight corruption such as the Public Procurement Act 2003, the Anti Money Laundering Act 2008, the Financial Administration Act, 2003 and the Whistle-blower Act, 2006 amongst others. But the inadequate resourcing of institutions meant to enforce these laws and a general lack of political will by political leaders to fight corruption continues to deepen the canker. In January, 2018, the current government established the Office of the Special Prosecutor, which is expected to be a truly independent body, devoid of partisan influence, to investigate and prosecute cases of corruption by public officials. It is expected that this office will significantly complement existing anti-corruption institutions, which by their nature, are heavily subject to the influence and direction of the executive.

The corporate governance regime in Ghana is a mixture of statutory law, legislation, guidelines and directors (Botchway-Dowuona et al. 2018). The main code of corporate governance among listed companies, however, is currently the Security and Exchange Commission (SEC) Code of Best Practices on Corporate Governance, issued in 2010. The Ghana Stock Exchange (GSE) listing rules also set out various guidelines on the governance of companies such as disclosure obligations, board governance and protections in respect of shareholder rights. Overall, the SEC, GSE and The Registrar of companies have the primary responsibility of overseeing the corporate governance regime of listed companies in Ghana.

The stock market of Ghana is the Ghana Stock Exchange which was formed in July 1989, although the idea of establishing a stock market was considered much earlier. It was initially established as a private company limited by guarantee under the Companies Act of 1963 (Act 179) and later given full recognition as an authorised stock exchange under the Stock Exchange Act of 1971(Act 384). Trading began on the floor of the exchange on 12th November, 1990, the same day the Council of the exchange was

inaugurated. The Ghana stock exchange currently runs an automated trading system that came into being in 2009. As at 2015, there were 39 companies listed on the Ghana stock exchange

Kenya

Kenya is a country located in East Africa, with a population of approximately 48 million. Also another former colony of the Britain, the country gained independence from British rule in 1963 and became a Presidential Republic a year later. Although the current political climate of Kenya may be currently seen as stable, the country has had its fair share of political turbulence since attaining independence. Between 1964 and 2002, Kenya was led by only two presidents in the persons of Jomo Kenyatta (1964-1978) and Daniel Arap Moi (1978-2002). Multi-party elections began only in 1992. In 2007, violence erupted as a result of the disputed presidential elections resulting in the death of about 1,500 people. This eventually led to some electoral reforms and further culminated in the establishment of a new constitution in 2010. The new constitution introduced a bicameral legislative house, devolved county government and a constitutionally tenured judiciary and electoral body (World Bank 2018b).

Although Kenya has one of the largest economies in the East African region, owing to a relatively more skilled labour force and better infrastructure, economic performance has perhaps not been commensurate (United Nations Economic Commission for Africa 2015). As at 2015, GDP and GDP per capita stood at $64b and $1,355 respectively. Kenya continues to remain the regional hub for ICT and financial services, and the service sector, in recent times, has been one of the highest contributors to GDP growth (African Development Bank 2018a). The tourism sector, which used to be a significant aspect of the Kenyan economy, has suffered some decline in recent years, mainly due to security concerns and threats. Overall, whilst the Kenyan economy has shown some resilience and has also been seen to exhibit a positive outlook over the past few years, a stable political climate and improved security would remain crucial to economic growth and how it can be sustained going forward.

Financial reporting, accounting and auditing requirements in Kenya are governed by the Companies Act 2015. This act replaced the 2009 revised version of the Companies Act of 1948, Act 486. The Institute of Certified Public Accountants of Kenya (ICPAK), set up by The Accountants Act of 1978 (as amended in 2008), is the recognised

accounting and auditing standard setter in Kenya. The use of IFRS was adopted in December 1999 without modification, pending the global effective date. The use of IFRS is mandated for all public companies whose securities are traded in a public market, whether domestic or foreign. The Companies Act also requires financial reports of all public companies to be audited by members of the ICPAK, in accordance with ISA, which were also adopted in 1999.

In terms of corruption and its perception, Kenya has one of the worst records, not just on the continent, but probably in the world. In the 2015 Transparency International Corruption Perception Index for example, Kenya scored 25/100, and was regarded as the 139th least corrupt country out of a total of 169 countries world-wide. Corruption has continued to persist in Kenya despite the existence of such institutions as the Ethics and Anti-Corruption Commission (EACC). Thus, corruption in Kenya represents a very deep institutional problem whereby institutions that are meant to support the rule of law have continuously been undermined (Hope 2014). There is also a system of patronage by individuals of people in authority and political power which tends to exacerbate the problem of corruption (Hope 2011). Hope (2014) further argues that the increasing size of public sector bureaucracy has also created a very fertile ground for corruption to thrive as persons in charge of the provision public of services take advantage of their positions to make unlawful gains and enrich themselves.

As far as corporate governance is concerned, guidelines on corporate governance, prepared by the Capital Markets Authority (CMA), were issued in 2002. These guidelines are heavily borrowed from the UK Cadbury Report of 1992 and the South Africa King Report of 1994 (Waweru 2014). In 2015, the CMA replaced its 2002 corporate governance guidelines with a new code of corporate governance, which it considers to be more in sync with international best practices and standards. The implementation of the new code took effect from March 2016. The new code is seen as an enhancement of the 2002 code because it provides more clarity on conflicts of interest and also requires more disclosure by companies to improve transparency.

The Nairobi Securities Exchange (NSE) is the official stock market of Kenya, and was established in 1954. Between 1963 and 1970, it served as a regional stock exchange where a number of companies from Tanzania and Uganda (the three forming an East African community) were listed. Changes in political regimes in Kenya resulted in decisions that prevented free movement of capital and ultimately led to the delisting of

both Tanzanian and Ugandan companies. As of 2015, there were 63 listed firms on the exchange with a total market capitalisation of $20b. The NSE runs an automated trading system that was introduced in 2006.

Nigeria

Nigeria is Africa's most populous country with a current estimated population of about 190 million people. Similar to Botswana, Ghana and Kenya, Nigeria is a former British colony. It gained independence in 1960 and became an official Republic in 1963. Nigeria's system of government is a Federal Republic, modelled after the US system, and comprises 37 states. Executive power is exercised by a President, with the legislature made up of two houses, the House of Representatives and the Senate. A significant portion of Nigeria's political history after independence has been characterised by instability as a result of several military interventions that occurred, particularly between 1970 and 1999. Multiparty democracy was again restored in 1999, leading to the promulgation of a new constitution and the holding of elections. Since then there have been successful transfers of power from one civilian government to another. Despite the improvements in multi-party democracy over the last two decades, ethnic wars and the rise of terrorist groups such as Boko Haram have posed and continue to pose a threat to the political stability of the country.

Nigeria is regarded as a middle income country. As of 2015, GDP and GDP per capita stood at $480b and $2,655.2 respectively. One of the main drivers of the Nigerian economy has been oil, making the economy quite susceptible to volatility in oil prices on the world market. The economy suffered a decline in growth between 2015 and 2016 due to the decline in the global oil prices but has since shown positive signs of recovery as oil prices also continue to rebound (African Development Bank 2018b). Prior to 2015, the economy grew at an average of 5.7% per year between 2006 and 2016. Other sectors of the economy such as Agriculture, Telecommunications and Services have also remained critical to economy. The banking sector has also undergone some recapitalisation within the last decade, which has contributed to a relatively stronger and healthy banking system. Economic growth, however, and like in most other countries in Africa, has not really translated into prosperity for the citizenry as levels of poverty continue to remain high. Further, the lack of regular and reliable supply of power poses a significant threat to industrial production.

With regards to the Accounting and regulatory environment, companies in Nigeria are governed by the Companies and Allied Matters Act of 2018, which was passed to repeal the previous Companies and Allied Matters Act of 1990. The Financial Reporting Council (FRC), established in 2011, is currently tasked with the responsibility of developing accounting standards for the preparation of financial statements by companies. The FRC replaced the National Accounting Standards Board (NASB), which was set up in 1982. The NASB was dissolved and replaced with the FRC to allow for a more robust and independent entity that will adequately meet the growing development in accounting regulation (Financial Reporting Council of Nigeria 2018). The FRC, pursuant to its enabling act, also oversees the auditing environment of companies. Financial statements in Nigeria are currently prepared in accordance with IFRS, which became effective in 2012. The adoption of IFRS was due to the need to converge Nigerian Accounting Standards with high-quality global accounting standards (Umoren and Enang 2015).

Nigeria's record on corruption has been quite abysmal over the years. As can be seen from Table 2.1, the country had a corruption perception score of 26/100 in 2015, making it the 136th least corrupt country in the world out of a total of 169 countries surveyed by Transparency International. Corruption in Nigeria thrives mainly due to the need by perpetrators to extract rent from the state and to preserve political power (Transparency International 2014a). This is manifested in huge embezzlement of resources, bribery, kickback and nepotism amongst others. Corruption is also highly prevalent in the public service delivery system, especially in areas such as education, health, and water supply. This creates a significant challenge for many citizens to access these essential services seamlessly as one form of bribe or another is always demanded (Kayode et al. 2013). Another key element underlying corruption in Nigeria is that there is a general lack of robust institutions and systems to fight corruption as the canker appears to have been institutionalised (Hope 2017).

In terms of corporate governance, the regime in Nigeria, similar to most other African countries, is characterised by a combination of statutory and subsidiary legislation. The general laws include the Companies and Allied Matters Act. In terms of specific codes of corporate governance, there exist codes for publicly listed companies as well as sector-specific companies. The current code of corporate governance is the SEC code of corporate governance 2011, which was developed as a revision to the first code that was issued in 2003. There is also the corporate governance for Banks and Discount

Houses, and the Guidelines for Whistle-Blowing 2014. In addition, there is also the Nigerian Communications Code of Corporate Governance for firms in the Telecommunications industry.

The stock market of Nigeria is the Nigerian Stock Exchange. The Nigerian stock exchange is one of the largest stock exchanges and financial centres in Sub-Saharan Africa. Over the past 50 years, it has contributed immensely to the development of the financial system and the country as a whole. In 1993, the market was deregulated. Also, in 1995, a number of laws were repealed which created more favorable conditions for participation by foreign investors. Since then, foreign inflows have risen substantially.

South Africa

South Africa is a country located in the Southern-most part of Africa. South Africa operates a presidential republic system of government and has been a republic since 1961. South Africa's political history has been marked by a long period of apartheid which involved periods of racial division and segregation. This was because, until 1994, the country was ruled by a white minority government. Apartheid was eventually abolished in 1994 and the country has enjoyed a relatively more stable political environment.

The South African economy is one of the largest on the continent. It is also one of the most industrialised countries in Africa and an upper-middle country. As at 2015, GDP and GDP per capita stood at $320bn and $5,746.7 respectively. It is the only African country which is a member of the G-20 group of nations. The main sectors that drive the South African economy have been agriculture and mining. South Africa is one of the world's leading mining and minerals processing countries. Its four key exports include; coal, platinum and iron ore (African Development Bank 2018c). This therefore also makes the country's economy somehow vulnerable to fluctuations in international commodity prices. One of the challenges of the South African economy, however, is the inequality in the distribution of income and wealth. Further, corruption, and the lack of sufficient skilled labour continue to pose a threat to the economic gains of the country.

The financial reporting requirements of companies in South Africa are governed by the companies Act of 2008. Firms are required to prepare their financial statements in accordance with IFRS. The Johannesburg Stock Exchange listing rules, which also make some provisions for financial reporting and disclosure, has since 2005, required publicly listed companies to prepare financial statements in accordance with IFRS. The Financial

Markets Act of 2012 also provides additional disclosure and reporting obligations for listed companies. The Independent Regulatory Board for Auditing regulates the audit profession and the auditing of South African companies, which is done in accordance with International Standard on Auditing.

South Africa has had its fair share of challenges as far as corruption is concerned. Corruption continues to remain prevalent among politicians and government officials. It also manifests itself in dealings between the private sector and the government (state capture), with the recent Gupta scandal being a classic example. This scandal, in particular, involved how a power elite around the then President, Jacob Zumah, managed to centralise control in the areas of public services, national treasurer, and the security and intelligence service, amongst others (Meyer and Luiz 2018). In the 2015 corruption perception index by Transparency International, South Africa had a score of 46/100 and was ranked 61 out of a total of 169 countries. For a country that is regarded as one of the most developed on the continent, this is perhaps not a very encouraging record.

In terms of corporate governance, the landscape is regulated by a number of pieces of legislation including the Capital Markets Act 2012. However, the main framework for corporate governance since 1994 has been the King's report on corporate governance and its subsequent modifications. The first Kings report, King I, published in 1994, is largely modelled on the UK Cadbury report of 1992, especially with regards to internal corporate governance structures, adopting a more integrated approach that included fairness and responsibility (West 2009). In 2002, a new version of the King's (King II) was published. This included new sections on sustainability, the role of the board and issues about risk management. It also offered more clarity on how the inclusive approach to corporate governance can be implemented (Institute of Directors 2002). A third version of the King's report was introduced in 2009 which extends corporate governance to non-profit organisations and included such issues as alternative dispute resolution, risk base audit and it governance. The current version of the King's report, King IV, was published in 2016 with the view to making it more accessible and applicable to all types of entities and across sectors.

The Johannesburg Stock Exchange is the largest stock exchange on the African continent (FT 2014). As at the end of 2015, there were 395 companies listed (ASEA Yearbook 2014). Indeed, The Johannesburg stock exchange is among the world's 20 largest exchanges by market capitalisation (ASEA Yearbook 2014). The exchange

currently offers a wide array of financial instruments including equities, bonds and derivatives. The equity market of the JSE comprises the Main Market (Main Board) and Alternative Market (Altx). The main board comprises large and well-established companies whilst the Altx is meant to cater for good quality but small to medium-sized growth firms. The Johannesburg Stock exchange is equally home to a good number of foreign companies who enjoy secondary listing status. Foreign firms were allowed to list on the JSE since 2004. Again, through a fast-track policy, foreign are allowed to leverage the processes of their primary listing to ensure a smoother and quicker secondary listing. Thus, foreign exchange rules, which limit the amount of foreign securities local investors can hold, were lifted, making the JSE an even more attractive listing destination.

2.4 Political, economic and regulatory characteristics of sample markets

Table 2.1 provides a summary of key political, economic and regulatory characteristics of the five markets in the sample as at 2015. The year 2015 is used because it represents the end of the sample period for this study. As already mentioned earlier in the country profiles, and as can be observed from the table, all five countries practise democratic systems of government. Botswana and South Africa both practise a parliamentary republican system of government with a President who is both head of state and head of government, a variation of the parliamentary system where there is a Prime Minister and Ceremonial head of state (President). Ghana and Kenya, on the other hand are both presidential republics where the President acts as only head of state. Nigeria equally has a President who acts as head of state but the system of government practised is that of a Federal republic, akin to the system practised in the United States. It is interesting to observe these differences although all five countries are former colonies of the Great Britain. This perhaps is evidence of the fact that most countries have truly become politically independent with the ability to choose a system of government that works well for them.

In terms of the other characteristics, Table 2.1 shows that Nigeria has the largest economy amongst the five countries, and indeed in the whole of Africa. South Africa has the second largest economy both amongst the five countries and on the continent as well. Botswana has the smallest economy amongst countries in the sample. Nigeria recorded the largest cumulative growth in GDP between 2005 and 2015 whilst South Africa has seen the lowest over the same period. Although Botswana has the smallest level of GDP,

it has the highest GDP per capita amongst the five countries. This obviously is due to a relatively lower population. South Africa has the second highest GDP per capita whilst Ghana has the lowest albeit not significantly lower than that of Kenya. Again, Botswana is the only country that has a much better record when it comes to corruption. It is the only country among the five countries that had a corruption score of above 50 in the Transparency International corruption perception survey, and also has the best ranking. Kenya has the worst of all the five countries with Nigeria very much in close succession.

Further, and as also mentioned earlier, all five countries in the sample have adopted IFRS based on which listed companies must prepare their financial reports. Table 2.1, however, shows different times for the adoption of IFRS, with Kenya and Nigeria being the first and last respectively to adopt. Also, all five countries have corporate governance codes, introduced at different times. South Africa, arguably has the most robust corporate governance code as it was largely modelled on the UK code of corporate of governance. Moreover, because the South African code has been in existence for a relatively longer period of time, it has obviously had the benefit of a number of revisions, based on past experiences, in order to make it more robust. Botswana was the last country among the five to adopt a corporate governance code in 2013, although as already mentioned in the country profile section, this code appears to overly focus on the board of directors. Companies in all five countries are also required to report their earnings in reasonable time after the end of their financial year. Nigeria and Ghana have the shortest of 3 months each whilst South Africa has the longest of 6 months. All five countries are also open to foreign investors and are covered by Bloomberg.

Table 2.1: Political, economic and regulatory characteristics of sample markets

This table presents financial, regulatory and development characteristics of countries in the sample. The information is presented as at 2015, and are obtained from various sources. The source of each information is indicated in the last column of the table.

		Botswana	Ghana	Kenya	Nigeria	South Africa	Source
1	System of Government	Parliamentary republic	Presidential republic	Presidential republic	Federal republic	Parliamentary republic	CIA World Fact Book
2	GDP ($m)	14,000	37,000	64,000	480,000	320,000	World Bank financial development database
3	Change in GDP 2005-2015 (%)	41.4	236.4	236.8	336.4	23.1	World Bank financial development database
4	GDP per capita ($)	6,527.5	1,353.7	1,355.0	2,655.2	5,746.7	World Bank national accounts data file
5	Change in GDP per capita 2005-2015 (%)	21.9	171.8	161.8	229.1	8.8	World Bank national accounts data file
6	Corruption perception score*	63/100	47/100	25/100	26/100	44/100	Transparency International
7	Corruption perception rank (least corrupt)	29/169	56/169	139/169	136/169	61/169	Transparency International
8	Accounting standards	IFRS	IFRS	IFRS	IFRS	IFRS	www.ifrs.org
9	Year of IFRS introduction	2007	2007	1999	2012	2005	www.ifrs.org
10	Existence of corporate governance code	Yes	Yes	Yes	Yes	Yes	Websites of SECs/Capital Market Authorities
11	First introduction of corporate governance code	2013	2010	2002	2003	1994	Websites of SECs/Capital Market Authorities
12	Reporting time for earnings after financial year	5 months	3 months	4 months	90 days	6 months	Companies/Securities Act
13	Involvement of foreign investors	Yes	Yes	Yes	Yes	Yes	World Bank
14	Coverage by Bloomberg terminal	Yes	Yes	Yes	Yes	Yes	Bloomberg

* Lower scores mean higher perceptions of corruption

The above characteristics and the accompanying comparisons may have some implications for stock return synchronicity and/or earnings informativeness in these markets. Firstly, and as already mentioned in Chapter 1, the conventional wisdom on stock return synchronicity had been that stock returns in more developed markets are less synchronous than those of developing countries as better developed political and legal institutions help to generate the availability of more reliable firm-specific information (Hasan et al. 2014). Based on this premise, it would reasonable to expect a high level of stock return synchronicity in these five markets as the size of their economies and challenges in the regulatory environment may create difficulty for the availability of more reliable firm-specific information. Perhaps an exception could be made for South Africa based on the early introduction of corporate governance codes. However, and as earlier alluded to, this study is motivated by a counter but intuitively appealing argument that stock return synchronicity can be high in more developed markets and conversely low in less developed markets. To that effect, it may not be completely surprising to observe averagely low levels of stock return synchronicity across all five countries and even lower for the relatively smaller and less developed among these five markets.

Secondly, the strength of the political and regulatory system may also be reflected in the levels of the perception of corruption. As can be seen from Table 2.1, Botswana and South Africa appear to have the best record in terms of corruption. Although this figure represents a one-year record, the same trend is actually observed for all years throughout the sample period. Thus, one may argue that Botswana and South Africa have more effective systems for legal and regulatory enforcement. This would have the impact of enhancing the information environment of firms and increase the reliability of firm-specific information, leading to lower levels of stock return synchronicity. However, the reverse may be also true in that an enhanced information environment, stemming from lower levels of corruption perception, could also mean that investors are more able to accurately predict events and therefore act with less surprise when these effects occur. This creates a situation where stock return synchronicity could be averagely lower for firms in Ghana, Kenya and Nigeria.

Thirdly, and with respect to earnings informativeness, all countries currently adopt IFRS. All else equal, this would be expected to contribute to enhancing the credibility of accounting information and the information content of earnings. However, whether the

adoption of IFRS lead to greater informativeness of earnings relative to the pre-adoption IFRS period, is an empirical question which the third empirical analysis of this thesis (Chapter 7) aims to answer. However, and as already mentioned in Chapter 1, the literature on the impact of IFRS adoption on earnings informativeness has largely agreed that IFRS can only be effective in influencing earnings only in an atmosphere of proper legal and regulatory enforcement. This is based on the simple premise that capital market implications of IFRS can also be affected by country-specific characteristics. This may therefore have the implication of leading to no significant improvement in earnings informativeness following the mandatory adoption of IFRS in these countries, where regulatory enforcement still poses a great challenge. On the other hand, the presence of corporate governance codes and stock listing rules (which are later discussed in this chapter) would help to provide an avenue for corporate information such as earnings to be disclosed and might therefore lead to some level of earnings informativeness.

It is also instructive to reiterate the participation of foreign investors in these markets. Indeed, developing and emerging markets, including those in Africa, have been considered as means to enable both foreign portfolio and foreign direct investment (Hearn et al. 2010). Hasan et al. (2014) further argue that foreign investors are better skilled at collecting and trading on firm specific information. Therefore, and all else equal, the presence and participation of foreign investors in these markets can contribute to reduction in stock return synchronicity and also improve earnings informativeness. The coverage of firms in these countries by Bloomberg may also make these markets more open to international investors and also contribute to the price discovery process. However, differences in the time of reporting earnings information among countries might also cause variations in the informativeness of earnings. Both Nigeria and Ghana have the shortest length of time for companies to report their earnings. However, it remains to be seen whether this is reflective of the actual amount of time companies actually take to report their earnings. This obviously will equally be a matter of regulatory enforcement and chapter 6 of this thesis looks more closely at the reporting lag, which measures the number of days between the fiscal year end of firms and the actual date of their earnings announcement.

2.5 Operational and developmental characteristics of sample stock markets

Table 2.2 compares some institutional, operational and development characteristics of stock markets in the sample. The South African stock market is the oldest among the five stock markets and is also the market with the largest number of listed firms. As at 2015, there were 395 listed companies on the Johannesburg Stock Exchange. Botswana and Ghana both have the youngest stock exchanges although the Botswana stock exchange has the smallest number of listed firms (32 as at 2015 whilst Ghana had 39). The Kenyan and Nigerian stock exchanges have been in existence for a relatively longer period of time, having been established in 1954 and 1960 respectively. Kenya has however witnessed the highest percentage increase in the number of listed firms between 2005 and 2015. The South African stock exchange is also the largest among the five countries with a total market capitalisation of about $756bn as at 2015. Botswana, on the other hand, has the largest market capitalisation to GDP ratio. This is not surprising since Botswana has a relatively lower level of GDP compared to the rest of the four countries. The length of existence and size of this markets may have some implications for the size and age of firms. All things being equal, it would be expected that firms in the larger and older markets like South Africa and Nigeria would also be older and larger. This can then affect their information environment and by extension, the level of synchronicity of their stock returns. Chapter 5 of this thesis examines the impact of age and firm size on stock return synchronicity more closely.

The Johannesburg Stock Exchange is also the most liquid of all the five markets. It had the largest volume of shares traded as at 2015 of about 74 billion shares whilst Ghana had a total volume of shares traded of about 246 million shares in 2015. Between 2005 and 2015, the Botswana Stock Exchange experienced the largest percentage increase in volume of shares traded. The value of shares traded in each of the five countries some-how mimic their volume of shares traded in that South Africa equally had the largest volume of shares traded whilst Ghana had the smallest value of shares traded as at 2015. Similarly, Botswana experienced the greatest percentage increase in the value of shares traded over the sample period. Thus, overall, South Africa is largest and most liquid of all markets in the sample. Kenya and Nigeria and by the number of listed firms, volume of shares and value of shares traded, represent mid-sized stock markets. Ghana and Botswana on the other hand, and given the data presented in Table 2.2, could still be classified as small and relatively illiquid, although Botswana has a high market capitalisation, owing largely to the presence of blue chip companies from South Africa.

Generally, one can argue that most African stock markets, perhaps with the exception of South Africa, are relatively small and still suffer from challenges about illiquidity. The liquidity of each of this markets may also have implications for the trading frequency of companies and the ability of stocks to incorporate firm specific information such as earnings.

Also, all five stock markets operate a five-day trading week (Monday to Friday). However, the number of trading hours per day varies on each stock exchange. South Africa has the longest trading hours of 8 per day whilst Ghana and Kenya both have the lowest of 5 each with Botswana and Nigeria having trading 6 hours each per day. With the exception of South Africa, the current number of trading hours in each of the other four countries represents an increase from the past. As at 2007, (see Ntim et al. 2011), the Botswana Stock Exchange operated a 1 hour trading day whilst those of Ghana, Kenya and Nigeria operated 2 hour trading days each. Like most other markets on the continent, all five stock markets in the sample operate automated trading systems, with some introducing these systems only more recently. For example, Botswana was the latest among the five countries to introduce an automated system in 2012. Both South Africa and Kenya introduced automation before the advent of the 21st century. All stock markets currently operate a T+3 clearing and settlement for equities. This is largely consistent with international standards, although some advanced countries are moving to shorter cycles such as T+2. Again, with the exception of South Africa, where derivatives trading is allowed, all other four stock exchanges do not have mechanisms for the trading of derivative instruments. Furthermore, as part of efforts to integrate these markets internationally, all five stock markets are members of the African Securities Exchanges Association (ASEA), but only Kenya, Nigeria and South Africa are members of the World Federation of Exchanges. Finally, Kenya, Nigeria and South Africa have circuit breakers of ±10%. This causes trading of a security to be temporarily suspended when there is a more than 10% change in the price of the security. Ghana, on the other hand, has no rule on circuit breakers whilst Botswana has a variable rule. Thus, all else equal, we are more likely to observe higher price changes in Ghana and probably Botswana, than in the other three countries.

Table 2.2: Operational and developmental characteristics of sample stock markets

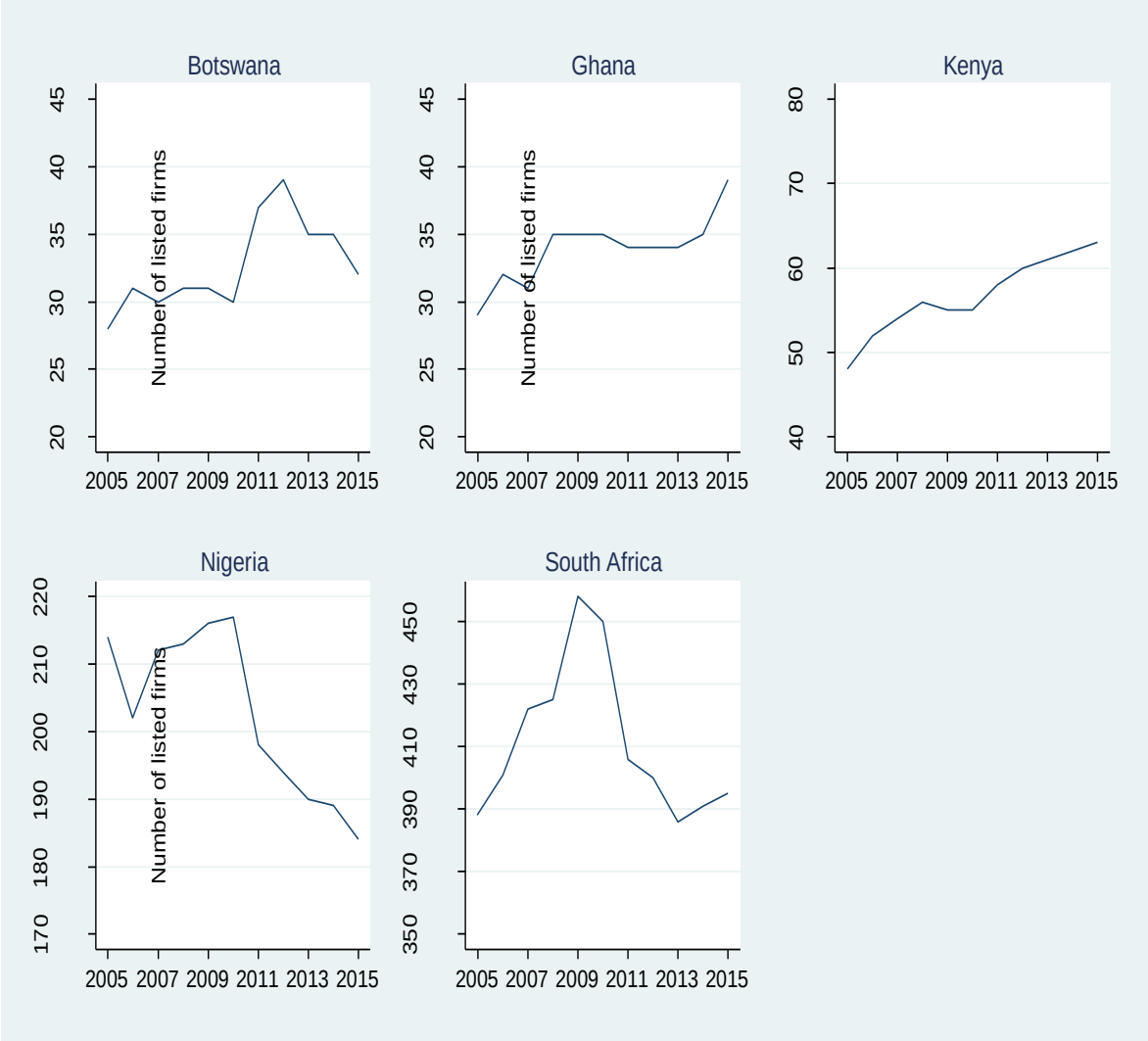
This table presents the institutional, operational and developmental characteristics of stock markets in the countries used for this study. The information is presented as at 2015, and are obtained from various sources. The source of each information is indicated in the last column of the table.

	Characteristic	Botswana	Ghana	Kenya	Nigeria	South Africa	Source
1	Year of establishment	1989	1989	1954	1960	1887	Stock exchange websites
2	Number of listed firms	32	39	63	184	395	www.african-exchanges.org
3	Change in listed firms 2005-2015 (%)	14.3	25.8	31.3	-14	1.8	www.african-exchanges.org
4	Market Cap ($m)	37,477.8	15,030.8	20,000.0	49,457.0	756,836.5	www.african-exchanges.org
5	Change in market capitalisation 2005-2015 (%)	179.3	147.7	225.7	120	33.3	www.african-exchanges.org
6	Market capitalisation to GDP ratio %	267.70	40.62	31.25	10.30	236.51	Author's computation
7	Change in market capitalisation to GDP ratio 2005-2015 %	96.3	53.63	4,363.70	-49.5	8.49	Author's computation
8	Volume of shares traded (millions)	1,603.3	246.4	6,996.8	70,078.1	74,406.0	www.african-exchanges.org
9	Change in volume of shares traded 2005-2015 (%)	3,530.30	202.73	700.3	162.5	36.3	www.african-exchanges.org
10	Value of shares traded ($m)	428.0	65.2	2,045.0	3931.5	992615.4	www.african-exchanges.org
11	Change in value of shares traded 2005-2015 (%)	807.8	28	323	70.9	114.2	www.african-exchanges.org
12	Number of trading days	5	5	5	5	5	www.stockmarketclock.com
13	Number of trading hours	6	5	5	6	8	www.stockmarketclock.com
14	System of trading	Automated	Automated	Automated	Automated	Automated	stock exchange websites
15	Year of automation	2012	2009	2006	1999	1996	stock exchange websites
16	Clearing and settlement for equities	T+3	T+3	T+3	T+3	T+3	Stock exchange websites
17	Derivatives trading	No	No	No	No	Yes	Stock exchange websites
18	Member of African Security Exchanges Association (ASEA)	Yes	Yes	Yes	Yes	Yes	www.african-exchanges.org
19	Member of World Federation of Exchanges (WFE)	No	No	Yes	Yes	Yes	www.world-exchanges.org
20	Price band and circuit breakers	Variable based on BSE	N/A	± 10%	± 10%	± 10%	Stock listing rules

Taken together, the above comparison of the institutional, operational and development characteristics of the sample markets reveal whilst all five months are currently similar in terms of some characteristics (i.e. automated trading, number of trading days), there are also still remarkable differences in other characteristics such as size, volume of trading and value of trading which, as already indicated, can then have different implications for stock return synchronicity and/or earnings informativeness.

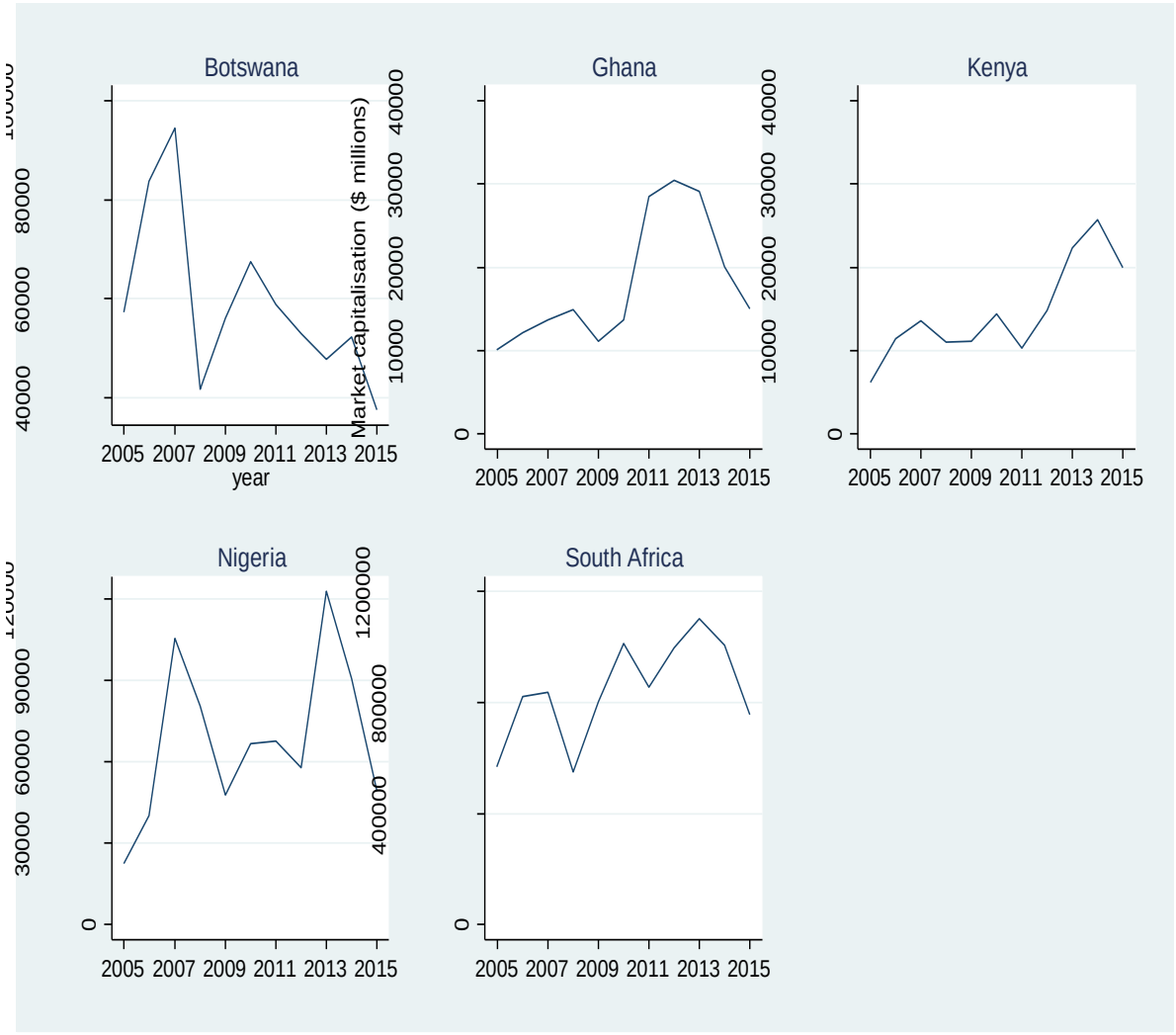
Figures 2.1, 2.2 and 2.3 depict the evolution of three major stock market characteristics of the five markets namely; number of listed companies, market capitalisation and volume of shares traded, respectively. These are presented over the sample period (2005-2015). As can be seen from Figure 2.1, the stock exchanges of Botswana, Ghana and Kenya have consistently had less than 100 listed firms. Both Botswana and Kenya have had their number of listed firms ranging from about 25 to 40 over the sample period whilst that of Kenya has ranged between about 48 to 65. This represents a relatively persistent low number of companies. One of the major reasons for the low level of patronage of stock markets by domestic firms in these markets is the extensive nature of information disclosure requirements and the fear of losing control and ownership rights (Acquaah 2015). Only Nigeria and South Africa have had over 100 firms listed on their stock exchanges over the sample period. However, Figure 2.1 shows what appears to be a noticeable decline in the number of listed companies in both Nigeria and South after 2011. This situation has been mostly due to delisting as a result of issuers of securities being unable to keep up with listing requirements. With respect to Figure 2.2, the market capitalisation of the stock exchanges of Ghana and Nigeria to a large extend mirror the trend in the number of listed companies. However, in the case of Botswana, a sharp decline can be observed between 2007 and 2008. This may have been partly due to the financial crisis as the Botswana stock exchange also plays host to a good number of firms from South Africa, a more developed market that will be more susceptible to the impact of global factors such as the financial crisis. Finally Figure 2.3 shows the trends in the value of share traded. Most notable movements in the value of shares traded across all countries appear to have occurred during the period of financial crisis, except in the case of Kenya, where there was a noticeable decline in the value of shares traded between 2013 and 2015.

Figure 2.1: Number of listed companies



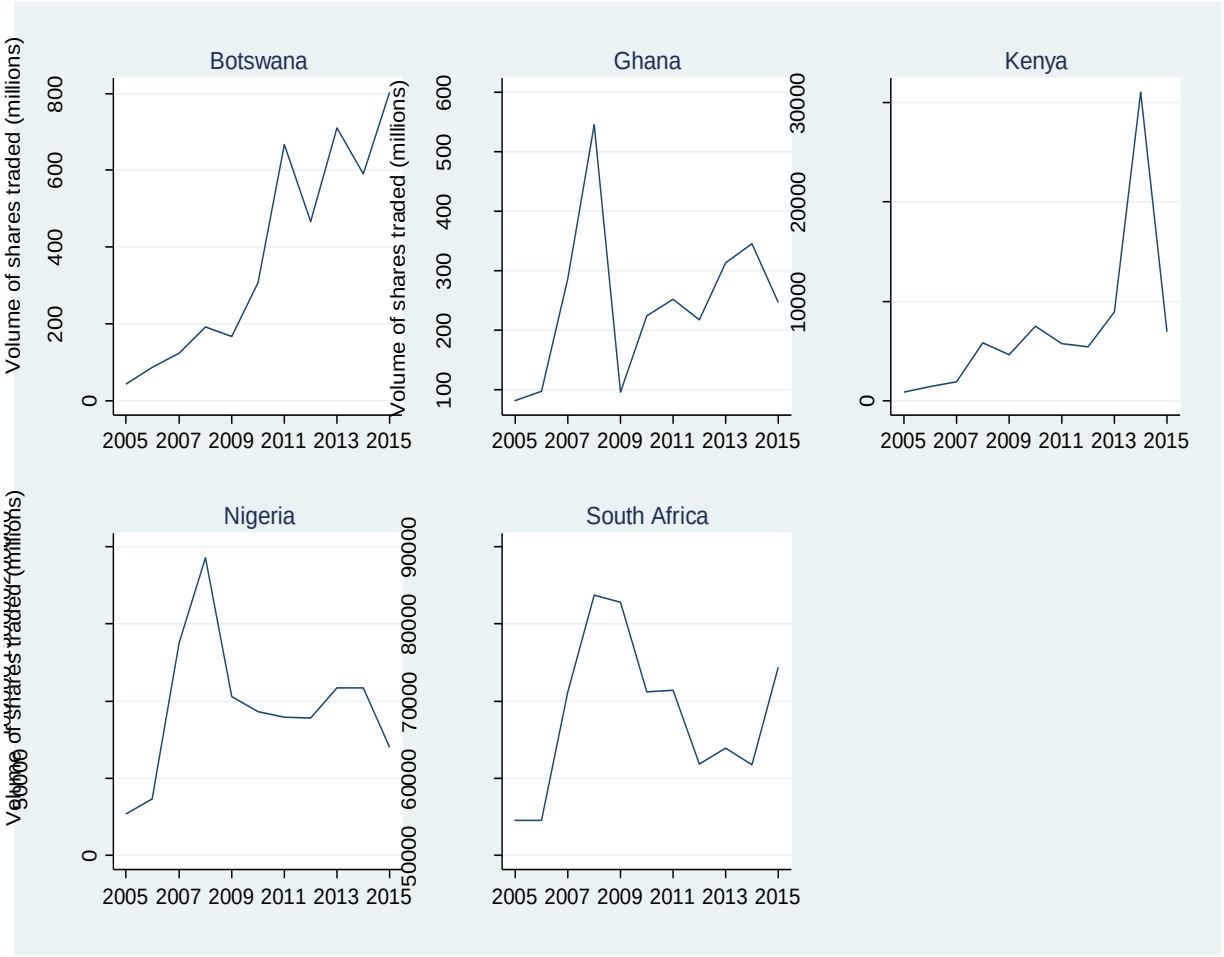
Source: African Securities Exchanges Association

Figure 2.2: Market capitalisation



Source: African Securities Exchanges Association

Figure 2.3: Volume of shares traded



Source: African Securities Exchanges Association

2.6 Framework for disclosure for listed companies

The dissemination of information by companies in Africa was mostly made in their annual reports. Thus market participants rely mostly on published annual reports to access information for investment and other decisions. It is therefore not surprising that many studies that have tried to measure corporate governance disclosures by African countries have usually done so by conducting content analyses of annual reports published by these companies (eg. Tsamenyi et al. 2007, Ntim et al. 2012b, Samaha and Dahawy 2010). This situation has however improved over time. Many stock markets in Africa now have electronic trading systems that enable investors and other market participants to obtain information on a real-time basis. In 2014 for instance, the Botswana Stock exchange launched its News Service, a platform to disseminate information about companies in real time. According to Jefferis and Smith (2005), the introduction of these electronic systems enhances the price formation process as they are more associated with greater efficiency of information dissemination. Also, the websites of African stock exchanges contain sections for company announcements most of which are described by existing legislation and regulations as being price sensitive (e.g NSE amendments to stock listing rules).

The main thrust of investor protection is to ensure the establishment and implementation of a legal framework that will govern financial markets in order to attract and retain investors. Studies such as McLean et al. (2012) argue that investor protection increases external finance and facilitates efficient investments. However, one crucial element is the existence of a framework that mandates firms to disclosure information to investors. This section presents the various relevant pieces of legislation that require firms to disclose value relevant information to market participants.

Botswana

The major regulatory framework for company disclosure in Botswana is enshrined in the Botswana Stock Exchange Listing requirements (1999). According to Section 3.3 of the document, companies are required to, and without delay, publish announcements giving details of:

> *(a) "circumstances or events that have or are likely to have a material effect on the financial results, the financial position or cash flow of the issuer and/or information necessary to enable holders of the issuer's listed securities and the public to avoid the creation of a false market in its listed securities*

(b) "any new developments in its sphere of activity which are not public knowledge and which may by virtue of the effect of those developments on its assets and liabilities or financial position or on the general course of its business, lead to material movements in the ruling price of its listed securities."

Ghana

The stock exchange listing rules (2006) of the Ghana Stock exchange under Part VII provide quite an elaborate framework based on which companies listed on the Ghana stock exchange must provide information to all relevant stakeholders. Section 53(b) of the rules requires companies to "fully disclose to the public, the information necessary to make informed investment decisions." Under section 53(c), companies are expected to make the immediate release of any information which might be reasonably expected to have a material effect on the company's activities and the price of its shares. Similarly, all information about the affairs, events or conditions in the market for a company's share which might have a material impact on its share price and will be considered as important by a reasonable investor in making his investment decisions and taking investment actions must be disclosed (cf. Section 54(1b) and 54(1c)).

Kenya

The Nairobi Securities exchange listing manual, approved by the Capital Markets Authority (CMA) in 2013, stipulates in section 10.1, the general obligations of listed firms to disclose information and make announcements on items of material nature. Section 10 states that:

"An issuer shall, as soon as possible but not later than twenty-four hours, release an announcement giving details of:

i. *"Circumstances or events that have or are likely to have a material effect on the financial results, the financial position or cash flow of the issuer and/or information necessary to enable holders of the issuer's listed securities and the public make informed decisions on the issuer's performance and operations."*

ii. *"New developments which impact on the issuer's operations, trading and financial performance or any information whatsoever considered by the issuer to be price sensitive or could lead to material movements in the prices of its listed securities.""*

Nigeria

In Nigeria, the Stock Exchange listing rules of 2014 (as amended) makes adequate provision for the disclosure of corporate information by listed companies. For example, Section 1 states that:

> "*Every Issuer shall ensure that investors and the public are kept fully informed of all factors which might affect their interest and in particular, that immediate disclosure is made of any information concerning their interest which might reasonably be expected to have material effect on market activity in, and the prices or value of, listed securities*."

Companies are also required by Section 2 to provide immediate information about any circumstances that are likely to affect its financial condition materially. Again, significant changes in the nature of the business require timely and adequate disclosure and this is captured in Section 5.1 which states that:

> "*An Issuer is obliged to immediately disclose the details of any major changes in its business or other circumstances relating to the Issuer which are not directly specified in these Rules, but which are not public knowledge and which may, by virtue of their effect on the Issuer's assets, liabilities, operations or reputation, affect the price of its listed or traded securities."*

Companies are also guided by Sections 2 and 5.2 which focus on insider information and the disclosure of information to third parties respectively. Whilst section 2 enjoins companies to deny access to information to persons other than those who require it to exercise their functions within the company, section 5.2 enjoins companies to deny information to third parties without the prior notification of the Nigerian Stock Exchange.

South Africa

There are a number of pieces of legislation and regulations that govern companies and the financial markets in general in South Africa. These include:

1. The Companies Act 71 of 2008 (as amended by the Companies Act 3 of 2011)
2. The Johannesburg Stock Exchange rules 1 of 2005[1].
3. Financial Markets Act no 19 of 2012
4. The King report on Corporate governance

The Financial and Markets Act of 2012 makes express provisions that require listed companies to disclose relevant corporate information. According to Section 14(1a) of the Act, issuers of listed securities (companies) are required to disclose to the Johannesburg

[1] This has been amended regularly between 2007 and 2018 with the latest amendment being on 26th January, 2018

Stock Exchange any information about their affairs. Also in Section 14(1b) companies are required to disclose information to registered holders of their securities. But even more importantly and of interest is that where information to be disclosed can have an impact on the firm's securities, such information must be disclosed publicly (cf. Section 14(2)).

2.7 Nature of corporate ownership

A number of studies of African markets have examined the nature of corporate ownership structure, particularly with regards to the levels of ownership concentration. In South Africa for instance, although the South African market is the most developed on the African continent, ownership of firms appears to be relatively concentrated in comparison to other developed markets in the western world. Ntim (2009) finds ownership concentration to range from 7% to 99% with an average of 60% in a sample of 100 listed firms between the 2002-2006 periods. He also reports a significant percentage of institutional holdings averaging about 70% between the same periods. The South African market was characterised by pyramidal ownership structures and complex cross-shareholdings. However, more rigorous listing requirements by the Johannesburg Stock Exchange have helped in decreasing the incidence of this. But overall, dispersion of ownership is relatively low.

In Nigeria ownership of firms was mainly in the hands of foreigners prior to independence. But with the passing of the Nigerian Enterprise Promotion Decree in 1972, provisions were made to prohibit 100% foreign ownership of Nigerian companies (Ahunwan 2002). This led to major divestitures. The majority of the divested shares were acquired by the government, state institutions and a few wealthy individuals. To date, this trend continues to characterise the Nigerian corporate ownership landscape where Government, foreign institutions, and individual block holders dominate. In a cross-country study conducted by Abor and Fiador (2013) ownership concentration in Nigeria is equally substantial. Approximately 48% of shares of listed companies are held by institutional investors. This is a followed by significant holdings by individuals and government.

Ownership concentration is equally high within the Kenyan corporate sector and is characterised by significant levels of block holdings particularly by the government (Kiruri and Olkalou 2013). In a study involving Kenyan banks, they find that the

percentage of block ownership among these firms is about 52% with the lowest and highest being 43% and 75% respectively. Aside government, foreign owners hold the higher amount of shares. Ongore et al. (2011) in broader analysis find the average level of ownership concentration across five industries in Kenya to be about 61%. Thus overall, Kenya's situation seems not to be too different from other African countries and most developing countries in general.

As a developing country, Ghana's corporate climate is characterised by relatively higher levels of ownership concentration, consistent with the postulations of La Porta et al (1999), that, developing countries tend to be characterised by weaker minority shareholder protection which then leads to higher levels of ownership concentration. Tsamenyi et al. (2007) find evidence in support of this assertion. In a survey of 22 listed firms (which in present terms amount to over 50% of the total number of listed firms on the Ghana Stock exchange), they find that for each of the 22 firms the average percentage of shares held by the largest shareholder is approximately 50% with the highest being 90 % and the lowest being 24%. Also, the top three shareholders for each firm hold on average 73% of the shares of each firm. Over 50% of firms also had foreign ownership, mostly through institutional investors, and this accounted for an average of 60% in each firm. An average of 22.69% of the total shares held by the top three shareholders in 14 out of the 22 firms was owned by Government and state-owned enterprises. Families and individuals held, on average, 31% of the shareholdings in only 4 out of the 22 firms. The highest percentage of shares held by families and individuals in a single company was found to be 88%.

The above findings are very much consistent with the views of Abor and Fiador (2013) who also argue that ownership concentration is high in Ghana but more tilted towards foreign institutional investors and the Government, and less towards families/individuals. Indeed, a corporate governance country assessment conducted by the World Bank shows that significant stakes are held in listed companies by the government through the Social Security and National Insurance Trust (SSNIT), the state pension fund and main domestic institutional investor. According to the report, SNNIT has stakes in over 20 of the under 40 firms listed on the Ghana Stock Exchange with at least 20% stake in eight of these firms.

2.8 Summary

This chapter has highlighted the development, challenges and features of African stock markets with particular focus on the markets used in the study. The gradual increase in the breadth and depth of stock markets in the continent increasingly makes them a setting for capital markets research. The issues discussed in this chapter with regards to information disclosure, informational efficiency and ownership structure will facilitate the empirical analyses contained in this thesis in better context. Although the stock markets of the above countries are relatively small in comparison to developed countries, there appears to be some growth in the size of these markets and could be a reflection of the role stock markets could play in promoting economic growth. A major issue and rightly highlighted by many studies is that these markets are less liquid. But overall, there appears to be a reasonable regulatory framework within which companies must operate as well as disclosure material information that may have an impact on their share price and to guide investors in their decisions.

The next chapter provides a review of both the relevant theoretical and empirical literature.

Chapter 3

Literature Review

3.1 Introduction

This chapter provides a critical review of the related literature to the study. There has been significant attention devoted to the study of stock return synchronicity, earnings informativeness and the influence by institutional factors on market pricing in different countries. Section, 3.2, discusses the theoretical underpinnings of the thesis focusing mainly on market efficiency and information asymmetry. Section 3.3 discusses the relevant empirical literature related to stock return synchronicity, earnings informativeness and institutional development. Section 3.4 identifies the gaps to be address and also shows the interrelationship between the three main strands of the literature; stock return synchronicity, earnings informativeness and institutional development. Section 3.5 concludes with the chapter with a summary.

3.2 Theory

This section presents the theoretical concepts that underpin the thesis. They include market efficiency, investor protection, and information asymmetry.

3.2.1 Market efficiency

The view that stock markets are efficient implies that publicly available information is fully reflected in stock prices at all times. It also implies that stock prices reflect the fundamental values of companies, i.e the expected future cash flows from the company to the shareholder. Hence by holding past or current information, no investor can earn a return beyond what is already offered by the market as this information would have already been impounded into stock prices. According to Ball (1996), this publicly available information is meant to be accessible to all market participants at no cost. Once the cost of having such information is zero, at a competitive equilibrium where cost equals revenue, the return of holding such information should also be zero, implying that prices have already adjusted to such information.

Hence in his review of the market efficiency literature, Fama (1970) finds that for a market to fully reflect all available information there should be among others: no transaction costs in trading; costless availability of information; and an agreement on the impact of the current information on both the current and future prices by all investors.

But he also asserts that these conditions, although sufficient, are not necessary because they are quite untypical of markets in practice. For instance, if not all, but a sufficient number of investors have access to available information, markets could still be efficient. Again, unless some investors can make better assessments of information beyond the value such information should have, a disagreement among investors should not strictly imply market inefficiency. Finally, markets could still be efficient in the presence of transaction costs to the extent that the marginal benefits of using available information are equal to the marginal cost of acting on the information (Jensen 1978).

Market efficiency thrives within a context of market equilibrium or a model that specifies expected returns, leading to the problem of the joint hypothesis (Fama 1970; Summers 1986). This market equilibrium is of the type where prices reflect all available information. However and often so, market equilibrium is also expressed in terms of expected returns. Therefore, a simple model proposed in Fama (1970) is given as;

$$\mathrm{E} = \left(\tilde{\mathrm{P}}_{\mathrm{j,t+1}}|\phi_{\mathrm{t}}\right) = \left[1 + \mathrm{E}\left(\check{\mathrm{r}}_{\mathrm{j,t+1}}|\phi\right)\right]\tilde{\mathrm{P}}_{\mathrm{jt}} \qquad 3.1$$

Where E is an expected value operator; $\tilde{\mathrm{P}}_{j,t+1}$ is the price of a security j at a time t+1 which usually takes the form of a random variable; $\tilde{r}_{j,1+t}$ is the expected return in t+1, P_{rt} is the current price of the stock (at time t); and Φ is the set of information for which the price should fully reflect. From the above equation, Fama (1970) argues that Φ, which is the information, is used fully to determine the expected return and therefore, the price of the security would equally reflect all the information.

Grossman and Stiglitz (1980) propose an interesting dimension to the theory of market efficiency. Unlike Fama (1970) and others, they argue that information is not costless and as such prices cannot reflect all available information. This is because some investors spend resources to acquire information for which they should be compensated. Such compensation would normally come about when informed investors use their information to take better trading positions than informed investors. Based on this, they conclude that the informativeness of the price system largely depends on the number of investors who are informed. Prices therefore only reflect information of informed investors (who are able to acquire information). However, by, the actions these informed investors take based on their information, the uninformed investors also become informed through the price system.

Market microstructure (the market mechanisms on transacted prices) has also had implications for the efficiency of stock markets (Ball 1996, Dimson and Mussavian 1998, Easley et al. 2010). An intuitive explanation is put across by Bagehot (1971) in his article "the only game in town", using the example of a market maker. He argues that not all investors trade based on information because some are motivated by liquidity (wanting to convert securities into cash and vice versa). Liquidity motivated investors are usually exploited by market makers to offset losses they make from trading with information motivated traders. Market makers lose to information motivated investors because they will usually refuse to trade if there is a wide bid-ask spread of the market maker. This concept of the microstructure of financial markets seems not have been captured by the initial proponents of the theory of market efficiency.

Studies such as Vega (2006) claim that, whether the information is private or public is quite immaterial to market how efficient stock markets should be. Instead, she argues that what is important is whether the information is concentrated or diffused. If for instance, public information is more associated with noise traders rather than informed traders, markets are less likely to be efficient. Also, some private signals are sometimes triggered by public information which only a sophisticated or skillful investor can notice. Thus, the distribution of information is more critical to making markets more efficient, as opposed to the availability of information.

Another dimension to the theory of market efficiency is vividly argued by Ball (1996) who claims that information is not a commodity that is necessarily of the same value to all investors as the theory suggests. Indeed, investors treat the same information differently and this could lead to reactions that are inconsistent with market efficiency. The values different investors place on the same information could also depend on the cost they incur in acquiring and processing that information. The fact that markets react to publicly available information, as implied by the theory, suggests that information is costless. However, he argues that, even if information were costless to obtain as the theory suggests, it is not costless to interpret. This therefore implies that markets can be efficient only to the extent to which it costs investors to process the information they obtain. Whether the benefits of holding this information will compensate for this cost of interpretation may, however, be an empirical question.

One of the best direct evidences of market efficiency is provided through event studies as they give an indication of the adjustment of stock prices to new information

(Brown and Warner 1980, Fama 1991). Brown and Warner (1980), for example posit that, when prices quickly adjust to fully reflect new available information about a firm, there should be no persistent non-zero abnormal returns to investors. This view is more consistent with short run event studies as long run event studies sometimes find a continuous drift in prices after the event dates, which some argue, cast doubts on the existence of market efficiency (Summers 1986). However, Fama (1998) describes continuous drifts in prices after event dates as anomalies that are a result of either chance or the techniques used. He further argues that, as long as most long run studies find an overreaction to the price which is apparently equal to underreaction, market efficiency still stands. Although through event studies, evidence has been provided to show that asset prices indeed respond to fundamental information, there have also been some studies that have actually found little evidence to support this view (eg. Foster et al. 1984, Bernard and Thomas 1990, Mitchell and Mulherin 1994, Bhattacharya et al. 2000, Tetlock 2007) . The key argument from this strand of literature is that movements in stock prices are characterised by irrational noise trading or are affected by private information. This could therefore suggest that the issue of whether stock prices reflect fundamental values in terms of incorporating publicly available information may not be fully resolved. Boudoukh et al. (2013), however, propose an interesting dimension to this debate. They suggest that the inability of stock prices to react corporate news is not necessarily symptomatic of market inefficiency but only implies that the news in question may not be relevant information about company fundamentals.

3.2.2 Investor protection and market efficiency

The link between investor protection and market efficiency, particularly its relation to financial development, is not trivial especially considering that market efficiency is strongest in an environment of fair, accurate and timely disclosure of information (Ball 1996). From the theoretical framework of La Porta et al. (2002), there is usually a tendency for majority shareholders to expropriate minority shareholders. This tendency could include keeping minority shareholders less informed about company activities by depriving them of information. It is for this reason that the provision of material information about companies to all investors is largely a matter of law in most countries. Such information (disclosure) reduces the information gap between informed investors and uninformed investors. It also reduces the gap between sophisticated and unsophisticated investors and, even more importantly, the gap between majority

shareholders and minority shareholders**.** However, the nature of compliance with laws and regulations is greatly influenced by the legal origins of the country in question (La La Porta et al. 1998, La Porta et al. 2000). Thus, within an investor protection setting, whether countries adopt common law (English law based on judicial precedents), civil law (based on statutes on codes) or mixed legal regimes (a combination of both common and civil law) could have a bearing on the level of how efficient their markets are.[2]

Again, the links between investor protection, corporate governance and market efficiency lie in the fact that differences in the levels of market efficiency could have implications for the severity of agency problems (Larcker and Tayan 2015). When markets are efficient, they act as a mechanism for disciplining corporations in that companies are held to the market's standard of performance. These standards include good corporate practices. Companies that do not meet these standards are punished with a reduction in share price and over time, their poor performance could subject them to the market for corporate control as they become acquisition targets. It is for this reason that studies such as La Porta et al. (1997) find that investor protection is greater in countries with more valuable and efficient stock markets. Further, when markets become efficient prices are expected to reflect information available to market participants. This phenomenon is most likely to compel management of companies to make rational decisions on how capital is allocated. Accordingly, La Porta et al. (2002) observe higher valuations of firms in countries with better protection of minority investors.

Further, in the absence of stock markets, companies turn to other sources of financing (Subrahmanyam and Titman 1999). These may include large families, large financial institutions, and government. Although such capital providers provide their own discipline mechanism by way of active monitoring to safeguard their interest, they may not necessarily provide an effective disciplinary mechanisms compared to that offered by efficient markets. This is because such large shareholders could use their position to extract the private benefits of control by for example, minimizing or delaying the disclosure of information (Attig et al. 2006).

Berkman et al. (2010) argue that in countries where judicial enforcement of laws is weak, the stock market can play an effective role in mitigating the agency problem. This

[2] In Section 4.2.1 of the next chapter, some reasons are provided for why there may be differences in capital market development between countries of different legal systems.

view seems to be shared by Klapper and Love (2004) who also argue that in such countries, firms might still want to adopt good corporate governance practices as they will attract and be rewarded by investors through the stock market. These good corporate governance practices involve the disclosure of relevant material information on how the firm is being run. Hermalin and Weisbach (2012) argue that good corporate governance practices, such as disclosure, reduce information asymmetry between managers and owners which ultimately lower the firm's cost of capital. On the other hand, lack of disclosure reduces the interest of investors in trading the firm's securities which diminishes liquidity and raises the cost of capital. Using data of publicly listed Chinese companies, Berkman et al. (2010) find that firms with weak corporate governance (measured by the value of related party transactions) experience greater abnormal returns when new regulations that prohibit related-party transactions of majority shareholders are announced as compared to firms with strong positive governance.

More recently, trust has been argued to be a major determinant of how investors perceive and react to corporate information and by extension, how efficient markets can be (Pevzner et al. 2015). They argue that although there are different dimensions to the national culture that help explain capital markets reaction to firm disclosures, trust has been identified to be most significant because it fundamentally underlies most economic transactions (Duarte et al. 2012). This strand of literature argues that trust has a positive relationship with investors' reaction to corporate information. For countries with weaker investor protection mechanisms and disclosure requirements, this relationship is even more pronounced as trust could proxy for more formal mechanisms. Again, consistent with the idea that trust can play a crucial role in poorer information environments, investor reaction to corporate information in an atmosphere of trust may still be high even in the presence of higher firm-level information asymmetry.

Efficient stock markets process information to enhance allocation of capital towards the best possible use (Morck et al. 2000). This information can either be at the market-wide level or at the firm-specific level. But more specifically at the firm level, Morck et al. (2000) assert that in countries where investors are poorly protected from the activities of corporate insiders, firm-specific information may not be very useful to risk traders. This could hamper the absorption of such information into stock prices and will ultimately lead to noise trading, where capital is allocated poorly thereby making markets inefficient. Further, in countries with both weaker corporate governance systems and

investor protection mechanisms, there is a tendency for information provided by firms and some market players to be inaccurate, which could impact adversely on market efficiency. Indeed, such practices according to Huang and Cheng (2015), lead to distortion of prices and the hindering of price discovery. They also refer to this as information–based manipulation, which involves the release of inaccurate information and misleading rumors. Intuitively, investors perceive information coming from people with privileged information as credible and will always want to act on such information when taking their investment decisions. But some available evidence suggests that some information may be put out for the consumption of the investing public as only part of a "pump and dump" or "poop and scoop" strategy, which does not augur well for market efficiency (Benabou and Laroque 1992, Huang and Cheng 2015).

Finally, there is a general notion that prices of better-governed firms are more informationally efficient than those of poorly governed firms. This is because, and as identified by Lee et al. (2016), better-governed firms have a greater likelihood of making timely value-relevant information available since their better governance structures will minimize the incentive for managers to withhold such information. This is also reflected in the fact that, with better disclosure and greater transparency emanating from improved governance structures, investors and other market participants can easily arbitrage away any mispricing to make prices reflect fundamental values.

3.2.3 Information asymmetry, disclosure and market efficiency

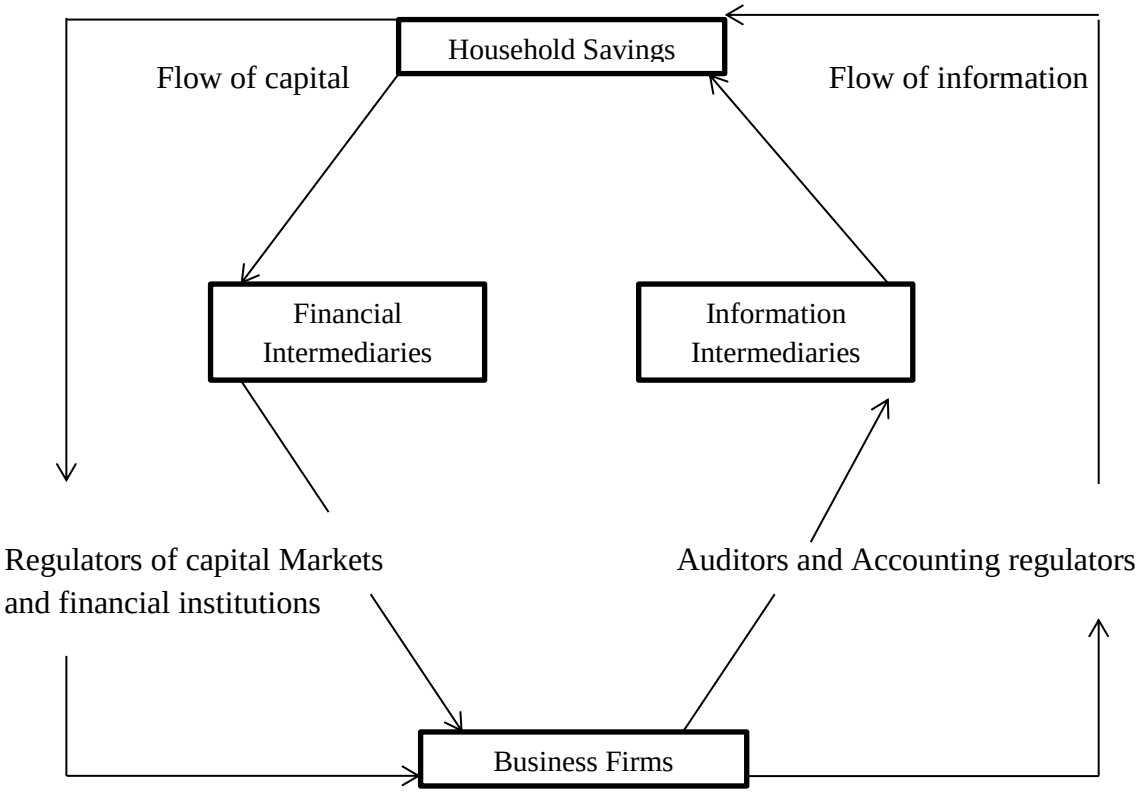
Information asymmetry problems are a major bedrock of firm information disclosure. Indeed, Healy and Palepu (2001) argue that the demand for firm disclosures have mostly emanated from information asymmetry problems and agency conflicts. When information problems are not corrected through disclosures, it becomes costly for potential shareholders to invest in companies and this can ultimately lead to an increase in a firm's cost of capital. Again, information asymmetry problems lead to the inefficient allocation of capital resources through a process similar to Akerlof (1970) lemon's problem which is also described succinctly by Healy and Palepu (2001). It therefore goes without saying that, disclosures contribute to lowering a firm's cost of capital and ensuring the efficient allocation of resources. The main forms of disclosures made by firms are in annual reports and regulatory filings. However, these are mandatory.

Disclosures may also be made voluntarily by companies, and this mostly takes the form of management forecasts, conference calls, corporate reports, announcements and press releases. Information intermediaries such as analysts, industry experts, and rating agencies have also proven to be a good source of company information. Although the essence of these disclosures (in whatever form they take) is to reduce information asymmetry problems, their effectiveness depends on how investors receive and act on them, for which reason market efficiency plays an important role.

Information asymmetry has implications for market efficiency because, and as explained above, the idea of efficient markets is about how responsive markets can be to information. As such, a lack of information arising out of non-disclosure does not create the opportunity for markets to be efficient in the first place. Jiang et al. (2011) argue that of great importance to the level of information asymmetry and disclosure is the level of ownership concentration among firms. Generally, they find that there is a positive association between the levels of ownership concentration and information asymmetry, which they measure using the bid-ask spread as in most studies (eg. Armstrong et al. 2011, Amiram et al. 2016). More specifically, they also argue that information asymmetry is positively related to ownership structures involving financial institutions and management, as it is perceived that they are more likely to be in possession of private information which they can use to expropriate other (usually minority) shareholders. This could deepen the adverse selection problem identified by Akerlof (1970).

Figure 3.1 shows the interconnectedness of intermediaries within capital markets. The left-hand side of the figure depicts how capital flows from savers (investors) to businesses. This is mostly done through financial intermediaries such as banks although it can equally be done directly. The right-hand side of the figure shows the flow of information from business to investors, who are the providers of capital. Again, although firms can communicate directly to investors through corporate press releases and financial reports, they can equally do so through information intermediaries such as financial analysts. But within the framework of information transmission, regulators and other players like auditors play an important role at ensuring that information provided by businesses to investors is of sufficient breadth and quality to help reduce problems of information asymmetry.

Figure 3.1: Information flow in capital markets



Source: Adapted from Healy and Palepu (2001)

Further, a major contributory factor to the existence of agency problems is information asymmetry between owners and managers. Zalewska (2014) provides two reasons for this. First, she argues that the increasing complexity of organisational forms of many large firms today makes activities within these organisations quite obscure. She also attributes information asymmetry to the progress of information technology which has led to more information available, and due to this information overload, investors rather find it more difficult to extract relevant information. Easley et al. (2010) argue that asset returns, and by extension, asset prices are affected by the risk of information asymmetry. Uninformed investors are not able to optimally diversify their portfolios because they are unable to choose the correct weights of assets to hold in their portfolios. As a result, they are likely to hold too few or too many of particular assets in their portfolio subjecting the investor to excess information risk.

The need to reduce information asymmetry forms one of the fundamental principles governing financial markets. That is to say, in every financial market, buyers must have a basic knowledge before making investments and should continue to have basic facts about those investments throughout the period they hold them. In as much as investors owe it as a duty to themselves to engage in due diligence, firms also owe it as an obligation to make relevant information available based on which investors can make their decisions. The depth and frequency of how information is disclosed plays a very significant role in reducing information asymmetry. Sankaraguruswamy et al. (2013) argue that information asymmetry is reduced in firms who release news frequently. Using two different kinds of investors; informed investors (investors who are able to access private information) and uninformed investors (investors who cannot afford costly private information and have to rely on public news), they find that an increase in the frequency of news releases raises the intensity of trading by uninformed investors (Myers and Majluf 1984). Similarly, Rahman and Debreceny (2010) find that investors in firms with frequent information disclosures possess better information sets than investors in firms who disclose information less frequently. In many developing markets, uninformed investors usually constitute a larger proportion of the investing public and therefore the frequency of how information is released may just be as important as the quality and content of such information.

Tetlock (2010) asserts that public news helps to resolve the problem of information asymmetry. This even goes a long way to enhance the liquidity of stock markets as well. He presents a theoretical model that suggests that before any information is made public, there is always a group of investors who appear to be more informed as they possess superior information. On the other hand, there is another group of investors who are relatively uninformed and depend entirely on public information. Despite the superior information possessed by the informed group of investors, they face a liquidity problem. But when information is made public and uninformed investors become informed, the risk aversion of the uninformed reduces, allowing them to provide liquidity to the informed investors and the market in general. This model is quite similar to that of Holden and Subrahmanyam (2002).

3.2.4 Corporate ownership as a structure of corporate governance

Corporate ownership and its structure represent a key governance structure within companies because it is a major source of potential agency problems (Jensen and Meckling 1976, Fama and Jensen 1983, Morck et al. 1988). The nature of such agency problems usually depends on the levels of ownership concentration (Fan and Wong 2002) In diffuse ownership structures, most agency problems revolve around the conflicts of interest between managers and outside shareholders. In this vein, and as identified by Ang et al. (2000), agency costs increase with the number of shareholders who are not managers and are also inversely related to the amount of manager ownership. On the other hand, in concentrated ownership structures, a more important source of agency problems lies in the conflict of interest between majority or controlling shareholders and minority shareholders. This phenomenon leads to entrenchment, where the actions and decisions of controlling shareholders are unfavorable to those of minority shareholders. In an atmosphere of weaker legal systems and poor corporate governance mechanisms, the problem gets exacerbated (Shleifer and Vishny 1997, La Porta et al. 1999).

Although ownership structure has been explained to represent a source of agency conflicts, it could equally serve as a tool for reducing agency problems. In diffuse ownership structures where the conflicts of interest are mostly between owners and managers, the free rider problem presents an impediment to mitigating agency problems by any single proactive shareholder (Shleifer and Vishny 1986). But large shareholders able to carry out monitoring due to the incentive of their higher stakes in the company.

This, according to Shleifer and Vishny (1986), is largely because the returns on the shares of larger controlling shareholders more than compensate for any cost they incur in monitoring. More recently, Dhillon and Rossetto (2014) assert that ownership structure can also be used to reduce conflicts of interest between controlling shareholders and minority shareholders. In their theoretical paper, they argue that because the preferences of investors over their risk profile are endogenously dependent on their level of shareholding, higher shareholding leads to a lower preference for risk exposure and vice versa. This creates a potential conflict of interest between large shareholders and minority dispersed shareholders in a sense that any investment decisions championed by the majority shareholder might be seen by small shareholders (who may have little or no voting right) as not being in their interest. But with the emergence of block holders who would be equally pivotal, by virtue of being able to vote, the large shareholder will have a commitment to shift his choice of risk in a direction that becomes more favorable to smaller shareholders.

The early work of Berle and Means (1932) paints a picture of a corporation where ownership is widely dispersed among many shareholders. Nonetheless, control of such firms will be vested in the hands of a few professional managers. In their view, dispersion of ownership among companies is a continuous and inevitable development that will occur especially as companies grow larger. A major contributory factor to this development is the participation in ownership by both customers and employees. Although this arguably creates an ideal image of a modern corporation, evidence as reflected in many subsequent studies, shows much more concentrated ownership (La Porta et al. 1999). In a survey of 27 nations across the world, La Porta et al. (1999) observe that many of these countries have companies that are not widely held, with a few exceptions in countries where there is stronger investor protection. Indeed, in many of these firms, they find significant cases of a controlling shareholder(s) who have control rights that are greater than their cash flow rights and usually achieve this through the use of pyramidal and other complex ownership structures as will be discussed subsequently.

The analysis of ownership of firms across the literature identifies a number of dominant players relevant to the African markets in this study.

3.2.4.1 Government ownership

Government ownership entails ownership of companies by the state mostly through Government agencies. The rationale for government's involvement in economic activities in general and corporate ownership, in particular, has been the subject of some theoretical debate. Two of the most important views that have been discussed in the literature are the development view and the political view (La Porta et al. 2002). Under the development view, government ownership of firms is important to propel development in strategic economic sectors especially where the private sector is very much incapable (Gerschenkron 1962). The political view, on the other hand, asserts that government acquires firms as a way of providing employment and benefits to supporters in return for votes. Evidence indeed shows that corporate ownership by the government is very common and pervasive especially in less developed countries, (La Porta et al. 2002). In their study (which was restricted to banks), they argue that government ownership is higher in countries with lower levels of per capita income, poorer financial systems and weaker protection of property rights. In support of the assertion that government ownership is higher in countries with weaker protection of property rights, Tian and Estrin (2008) claim that in such situations, concentrated ownership in the hands of a controlling shareholder, such as the government, is necessary to ensure that managerial agency costs are reduced. Borisova et al. (2012) claim that government ownership has been given more prominence because of the interventions most governments had to make worldwide following the recent financial crisis. They, however, find that government ownership of firms is negatively related to the quality of corporate governance, especially in civil law countries.

3.2.4.2 Family/individual block holders

Evidence of families and individual block holders controlling significant portions of companies in countries are quite well documented in the academic literature (Morck et al. 2005, La Porta et al. 1999). Such families and individuals, wealthy as they are, are able to grow their wealth by acquiring control over multiple companies. This extends to a situation where even a large amount of economic activity within these countries could be attributed to families and individuals Most of the time, the commonest way to amass such extensive control has been through the use of control pyramids as identified by La Porta et al. (1999). Indeed, they find that, with the exception of the US, countries around the world have many large corporations that are controlled by wealthy individuals and

families rather than dispersed ownership. Specifically, La Porta et al. (1999) document that with a control threshold of 20%, about 30% of large firms in an average country are family-controlled. These findings were subsequently confirmed by Claessens et al. (2000) in a similar study conducted in Asia as well as Faccio and Lang (2002) who studied only European countries.

3.2.4.3 Institutional investors

Over the years, the growth in asset management firms and pension funds has led to increased institutional ownership as many of these institutions continue to look for companies with growth prospects to invest in. Research has shown that a number of factors determine the choices institutional investors make when selecting their portfolios of stock. These include stocks with higher market liquidity and lower volatility (Huang and Shiu 2009), stocks with better corporate disclosures (Bushee and Noe 2000), stocks that pay dividends or engage in share repurchases (Grinstein and Michaely 2005) and stocks that with stronger managerial performance (Parrino et al. 2003). Another important factor in institutional ownership, which has been discussed by Chung and Zhang (2011), is the quality of firms' corporate governance mechanisms. This is especially so for countries with weak legal protection of investors as it is believed that good firm-level governance could serve as a substitute. Whilst some have argued that institutional investors usually seem not to be assertive in the governance structure because they have many holdings across firms and general protection of market liquidity, others also see the influence of institutional investors within the governance structure as key (Gillan and Starks 2000).

3.3 Empirical evidence

This section provides a review of prior related empirical literature of the key issues covered in this study.

3.3.1 Stock return synchronicity

This section provides of review of stock return synchronicity by discussing the meaning and implications of stock return synchronicity. It also discusses the determinants of stock return synchronicity at both the institutional and firm levels.

3.3.1.1 Meaning and implications of stock return synchronicity

Stock return synchronicity measures the extent to which stock prices are influenced by market-wide forces and has been the subject of a significant strand of literature (eg. Wurgler 2000, Durnev et al. 2003, Durnev et al. 2004, Chan and Hameed 2006, Dasgupta et al. 2010, Chan et al. 2013, Chan and Chan 2014). It reflects the ability of stock prices to incorporate firm-specific information. The idea of stock return synchronicity suggests that stock prices are mainly driven by two factors— market factors and factors that are idiosyncratic to the firm (Li et al. 2004). The impact of market-wide forces entails how individual stock prices move in response to movements of the market index. On the other hand, idiosyncratic factors concern how individual stock prices move in response to corporate information that is specific to the firm. Stock return synchronicity can also be explained as how stocks move in the same direction over a period of time (Morck et al. 2000). However, both definitions of synchronicity imply the ability or otherwise of stock prices to incorporate firm-specific information. Indeed, Roll (1988) argues that the ability of stock prices to move together is determined by the relative amounts of firm-specific and market-wide information that stock prices are able to absorb. Empirically, the classical measure of stock return synchronicity was introduced by (Morck et al. 2000). This measure involves computing the ratio of the number of stocks that move in the same direction over a period to the total number of stock movements within the same periods. This measure, however, is more concerned with giving an indication of a market level of synchronicity. A more popular measure, which captures synchronicity for individual firms, and based on Roll (1988), uses the R^2 from a regression of the return of a stock on

the returns of the market. A larger R^2, which indicates higher synchronicity, implies that most variations in the returns of a stock are driven by variations in market returns.

Despite the definition of synchronicity given above, there appears to be two schools of thought regarding its implications for stock price informativeness. The first school of thought suggests that stock return synchronicity is inversely associated with stock price informativeness. Firms with lower R^2 exhibit higher levels of stock price informativeness. Durnev et al. (2003) for example, find that for firms with lower R^2, current stock prices are more informative about future earnings. This is because lower synchronicity implies that higher firm-specific variability is facilitated by the activities and trading of arbitrageurs. The other school of thought, however, argues that there is a positive relationship between synchronicity and stock price informativeness. Piotroski and Roulstone (2004) use analyst data to show that stocks with higher synchronicity are more informative because analysts are able to increase the amount of industry information impounded into stock prices though industry information transfers. Chan et al. (2013) provide an interesting view. They argue that stocks with higher synchronicity are associated with higher price informativeness because market participants are able to infer more information about the company when it has a higher co-movement with the market. This also implies that such stocks will be more liquid.

3.3.1.2 Factors influencing stock return synchronicity

The literature on the factors that influence stock return synchronicity have focused on both country level and firm-specific factors. With respect to country-specific factors, Morck et al. (2000) find that stock return synchronicity is greater in countries with weak protection of property rights, which also tend to be characterised by lower levels of transparency. This discourages more informed trading by arbitrageurs who usually find information either unattractive or less useful. This ultimately results in a slower incorporation of firm information into stock prices. Jin and Myers (2006) extend the findings of Morck et al. (2000) by arguing that stock return synchronicity is higher in countries with less transparency as insiders in these countries tend to have more firm information, whilst outsiders face more market-wide risk. In a relatively more recent study on China, Hasan et al. (2014) find that stock return synchronicity is lower in provinces with better developed legal and political institutions as this reduces uncertainty and increases the reliability of firm-specific information. Further, in a study of 48

countries across the world, Fernandes and Ferreira (2008) observe a decrease in stock return synchronicity following the first time enforcement of insider trading laws as the elimination of insider trading helps to ensure that stock prices reflect the true value of the firm. They, however, argue that this effect is only present for countries with stronger legal institutions. Finally, Wurgler (2000) and Durnev et al. (2004) draw a connection between synchronicity and the efficient allocation of capital within countries. Better allocation of capital leads to proper functioning markets which in turn, increases the ability of stock prices to incorporate firm specific information.

In spite of what appears to be the conventional wisdom that stock return synchronicity is lower in countries with better developed legal, financial and political institutions, another strand of literature argues to the contrary. One of the key papers holding this view is Dasgupta et al. (2010), who argue that more developed markets have an enhanced information environment. Accordingly, investors are more able to predict future events about the firm, and when these events eventually occur, there is little surprise and lower reactions to such corporate information about such events. They test their hypothesis using seasoned equity offerings and cross listings, two corporate events where the information environment of firms will naturally be improved. They find that in the 2 years following the above two events, stock return synchronicity increases. Xing and Anderson (2011) introduce another interesting dimension by arguing that stock return synchronicity can be low in either a strong or weak market. This is because, stock prices incorporate both public and private information. Therefore, in a less developed market where private information might be high, stock return synchronicity could still be low as returns will incorporate firm-level private information. It is important to reiterate that these two papers provide an interesting twist to the literature on synchronicity. Accordingly, in Chapter 5, this thesis investigates whether, on the basis of Dasgupta et al. (2010), stock return synchronicity in a sample of less developed markets, like those in Africa, could be low.

With regards to the firm-level determinants of stock return synchronicity, one of the main issues that has engaged the attention of the empirical literature is the nature of corporate ownership. Indeed, stock markets take a firm's ownership into account when reacting to news (Fidrmuc et al. 2006). Reaction substantially varies according to the degree of outside ownership, type of outside owners and the degree of insider ownership. Firms with shareholders who play a strict monitoring role are more likely to reduce

information asymmetry and have lower levels of synchronicity. On the other hand, firms whose shareholders do not play a significant monitoring role to reduce information asymmetry may experience less substantial market reactions emanating from the higher information content of announced events. Hence different types of ownership structure of firms affect the level of synchronicity of their stocks. For example, higher ownership concentration causes more opaqueness and leads to lower incorporation of firm level information which results in higher stock return synchronicity (Gul et al. 2010). Brockman and Yan (2009) examine block ownership in a sample of Chinese firms and report that, because blockholders are in a better position to access more precise firm information at a lower cost than non-block or diffuse shareholders, stock prices of companies with substantial blockholders exhibit less synchronicity. Finally, firms with large shareholders, who have excess control (more control rights than cash flow rights), are also associated with stock return synchronicity as controlling shareholders, in their attempt to conceal opportunistic tendencies, would reveal less information, leading to high stock return synchronicity (Boubaker et al. 2014).

The literature on the firm-level determinants of stock return synchronicity has also looked at the impact of institutional investors and financial analysts. For instance, Piotroski and Roulstone (2004) argue that trading by institutional investors quickens the incorporation of the firm-specific component of corporate information such as earnings news. This obviously suggests that firms with higher institutional ownership exhibit lower stock return synchronicity. An and Zhang (2013) also assert that institutional investors have a greater incentive to monitor managers by virtue of their longer investment horizons and larger states. This results in more disclosure of firm-specific information and leads to lower stock return synchronicity. However, they also argue that for institutional investors who are transient, the relationship between stock return synchronicity and institutional ownership is positive. Using a sample of Taiwanese companies, Ting and Wang (2011) also observe a negative relationship between synchronicity and institutional ownership. They also find this relationship to be stronger where the level of foreign ownership is higher as also observed by He et al. (2013).

On the impact of financial analysts, Chan and Hameed (2006) use data from a sample of emerging markets to test two competing hypotheses. On the one hand, analysts would have a greater incentive to generate more firm-specific information because of the benefits to the market of having more information in markets that are relatively less transparent. Thus, there should be a negative relationship between stock return

synchronicity and analyst coverage. On the other hand, poor investor protection in emerging markets discourages informed arbitrage which may then discourage financial analysts from generating more specific information as opposed to market and industry-wide information. This would suggest a positive relationship between analyst coverage and stock return synchronicity. Their findings support the latter hypothesis as they find that returns of firms with greater analyst coverage are more synchronous. Although in a different setting, their findings are also consistent with those of Piotroski and Roulstone (2004), who argue that analyst generate more industry-wide information through intra-industry transfer and are therefore associated with greater stock return synchronicity. However, Crawford et al. (2012) posit that analyst coverage is positively associated with stock return synchronicity only in situations where the firms in question had no prior analyst coverage.

It is also important to mention that the role of firm size and age have engaged the attention of the empirical literature. Larger firms act as leading market indicators by signalling macroeconomic trends. They are also more diversified in terms of markets (Roll 1988), and are therefore more subject to the effect of market-wide movements than smaller firms. Hence their stock returns are more synchronous. Returns of older firms are also more synchronous because and as argued by Dasgupta et al. (2010), the market learns more about the time-invariant qualities of firms as they grow older, and this leads to the incorporation of more market-wide information into their stock prices, resulting in greater synchronicity. Chapter 5 of this thesis explores the role of firm size and age in more detail.

3.3.2 Earnings informativeness

This section provides a review of the relevant literature on earnings informativeness by discussing the information content of earnings announcements, the different measures of earnings informativeness, determinants of earnings informativeness and the concept of post earnings announcement drift.

3.3.2.1 The information content of earnings announcements

The information content of earnings and the market reaction to earnings announcements is perhaps one of the most studied corporate information in both the finance and accounting literature. In deed there is a large empirical literature that shows earnings

announcements carry information content (eg. Beaver 1968, Kothari 2001, Neuhierl et al. 2013, Chambers and Penman 1984, Defeo 1986, Bamber 1986, Cready and Gurun 2010). As such, the market reaction to earnings announcements (both quarterly and annual) is well established in the literature. Earnings are an important mechanism for ensuring accountability. But they also give an indication of the future earnings of companies. If the value of a company is the sum of discounted future earnings then information on the value of future earnings is required for markets to price firms accurately. To be more precise, the value of a company is the discounted value of future cash flows and earnings are simply the operating cash flows after accounting adjustments. Yet Dechow et al. (1998) indicate that historical earnings may be a more accurate predictor of future operating cash flows than historic cash flows. The importance of earnings announcements as a major form of corporate news and a source of market movements has been further demonstrated in a recent study by Boulland and Dessaint (2017) who find that investors react not only to earnings announcements but even to press releases by firms to give notice of their upcoming earnings announcement dates.

New information conveyed by earnings to the market causes investors to actively seek information during the pre-event window (Park and Lee 2014). This results in information asymmetry as investors vary in their ability to acquire and process information. Park and Lee (2014) also report that different types of investors, particularly institutional investors, trade profitably around earnings announcements. This trading takes place around both negative and positive earnings surprises. New information about future earnings will affect the demand for stocks and hence the market value of the firm. Berkman et al. (2009) argue that earnings announcements help to reduce variation in opinions among investors which ultimately increases the accuracy of valuations. In an extensive study of how markets react to different categories of press releases by US firms, Neuhierl et al. (2013) find that reporting of weak financial results are accompanied by negative market reactions on average whilst stronger financial reports trigger positive cumulative abnormal returns (*CAR*s). These findings are not only intuitive but also consistent with the literature on positive earnings surprises (Kothari 2001, Vega 2006).

One important aspect of the literature on earnings informativeness is the variation of earnings informativeness over time, with the evidence pointing to a rise in the information content of earnings announcements. Landsman and Maydew (2002) first documented an increase in the information content of earnings announcements between

the early 1970s and the 2000. Whilst no reason was provided for this trend, Francis et al. (2002), in a follow up study, argue that the increasing informativeness of earnings is due to the expansion of the amount of concurrent information that is provided together with earnings press releases over time. Thus, more detailed disclosure from GAAP-based earnings had been the major contributory factor to the increasing informativeness of earnings over the three decades in question. But Collins et al. (2009) depart from the arguments of Francis et al. (2002) by asserting that the increase in the information content of earnings announcements is rather attributable to street earnings as opposed to GAAP-based earnings because street earnings excludes many non-recurring and extraordinary items and are therefore more disseminated by analysts and clearing houses. In a very recent study, Beaver et al. (2018) also observe increasing patterns of earnings informativeness between 1971 and 2011 and find this to be more pronounced after 2001. They also observe increasing pattern of informativeness for more profitable firms, larger firms and firms with greater analyst coverage.

The amount of information embedded in earnings announcements has however not been without some debate. Ball and Shivakumar (2008) argue that on average, earnings announcements contain approximately only 1% to 2% of the total information available in the stock market, indicating that the amount of incremental information revealed by earnings announcements is modest at best. They suggest three reasons for this phenomenon. Firstly, whilst the revision in share prices occurs at a relatively higher frequency, accounting earnings by their nature are low frequency. Secondly, earnings releases, unlike other firm information, are not discretionary and are released regardless of whether or not there is new information to report. Finally, unlike other corporate information, earnings information is backward rather than forward-looking. These views are discussed further by Ball (2013) who argues that as opposed to providing substantial new information, earnings provide ‘confirmation’ of the firm’s financial reporting framework in order to discipline insider activities by managers i.e. earnings provide little new information but are primarily a mechanism for ensuring accountability.

3.3.2.2 Measures of earnings informativeness

Across the empirical literature on earnings informativeness, various measures have been used to capture how earnings announcements affect stock returns. This section of the

chapter provides a review of the main measures of earnings informativeness, some of which are subsequently used in the empirical analyses.

Abnormal returns

Abnormal returns are arguably the most popular measure of capturing the information content of earnings and how markets react to earnings announcements. Abnormal returns are mostly computed based on event studies as introduced by Fama et al. (1969). Event studies assess the impact of corporate events on stock returns over a window of time (Fama 1998). Abnormal returns are therefore the difference between the actual stock returns after the occurrence of the event and what the stock returns would have been, had the event in question not occurred (expected return). This goes without saying that abnormal returns depend largely on the method by which the expected return is determined.[3] Abnormal returns to earnings announcements are based on the idea that earnings will have information content if they can cause a changes in the assessment of investors about the probability distribution of future returns, leading to a change in the equilibrium value of the market price of the firm's stock (Beaver 1968). Significant price changes during the period of the earnings announcements will therefore suggest information content. Intuitively, abnormal returns provide an appealing measure of capturing information content and have therefore been used in many previous studies on earnings informativeness (eg. Hotchkiss and Strickland 2003, Collins et al. 2009, Kaniel et al. 2012, Neuhierl et al. 2013).

Abnormal return variance

Abnormal return variance, also sometimes called abnormal return volatility, provides another way of measuring earnings informativeness. This measure is similar in spirit to abnormal returns in that it is also based on the concept of an event study. For a given event window, abnormal return variance is the mean of the squared market model abnormal returns during the event window divided by the variance of the market model abnormal returns in the non-event window (see Landsman and Maydew 2002, DeFond et al. 2007, Collins et al. 2009, Landsman et al. 2012, Pevzner et al. 2015, Beaver et al. 2018). Abnormal return variance mainly captures the magnitude of price movements in response to information contained in the earnings announcement. However, and as would be observed from the previous studies that have used this measure, abnormal return

[3] Chapter 4 of this thesis provides some details on the different models for computing expected returns.

variance is largely based on the use of the market model for estimating the expected return for each firm.

Earnings response co-efficient

As a measure of earnings informativeness, the Earnings Response Co-efficient (ERC) captures the relationship between stock returns and unexpected earnings (Collins and Kothari 1989). The earnings response coefficient is based on a regression equation where the dependent variable is risk adjusted stock return, cumulated over a period, and the explanatory variable is the unexpected earnings (actual earnings less forecast earnings). The significance of the coefficient and the power of R^2 provide useful inferences about the informational value of earnings for stock returns. The use of the ERC dates back to the early work of Ball and Brown (1968). Unlike the event study approach which gauges the actions of investors around earnings announcement, mostly over short windows of time, the ERC typically focuses on relatively longer periods of time. Collins and Kothari (1989) further argue that the rationale for using regression to determine the ERC is to not to infer causality but to give an indication of how earnings captures relevant valuation events.

Trading Volume

The reaction to earnings announcements is not restricted to price changes around the earnings announcement, as price changes do not reflect the entirety of investors' reactions to the earnings announcements (Barron et al. 2016). Trading volume around announcement dates provides an alternative approach to determining if earnings announcements or other financial disclosures affect trading behavior (Bamber et al. 2011). Moreover, since investors may have individual expectations prior to earnings news releases, the arrival of new information elicits a revision of their individual expectations (Beaver 1968). Increased trading would be expected as investors rebalance portfolios (Kim and Verrecchia 1991). Atiase and Bamber (1994) conclude that trading volume of investors around earnings announcements is positively related to the level of pre-disclosure information asymmetry whilst Harris and Raviv (1993) and Kandel and Pearson (1995) argue that investors use different techniques to analyse the same information, which is likely to generate trading activity, especially when the information is material. Overall, and as mentioned by Beaver (1968), the impact of earnings announcements on investor behaviour is mainly either a test of price changes or trading volume.

3.3.2.3 Firm level determinants of earnings informativeness

Across the empirical literature on earnings informativeness, a number of factors have been proposed as explanations for the variations in earnings informativeness among firms. Similar to the firm level determinants of synchronicity, one of these factors is the nature of corporate ownership. This is unsurprising as the market reaction to earnings and other firm-specific information may be a reflection of the level of stock return synchronicity of firms. One of the early studies of the impact of ownership structure on earnings informativeness is Warfield et al. (1995) who find that managerial ownership is positively associated with earnings informativeness. This is because increased managerial ownership reduces the likelihood that managers would engage in non-value maximising behaviour thereby making accounting disclosures such as earnings more credible. They arrive at this conclusion by interacting earnings with managerial ownership in a regression equation that determines stock returns. Their findings are consistent with subsequent findings by Jung and Kwon (2002), who study a sample of Korean firms, and observe that earnings are more informative in firms where there is a majority shareholder who is also a manager as managerial ownership creates an alignment of interests. In contrast, Gabrielsen et al. (2002) find a negative relationship between earnings informativeness and managerial ownership in a sample of Danish companies. This finding is consistent with the management entrenchment hypothesis where it is believed that insiders, in an attempt maintain their hold of the firm, may engage in practices that create less transparency. But Yeo et al. (2002) and Sánchez-Ballesta and García-Meca (2007) introduce an interesting twist to this debate by observing a non-linear relationship between managerial ownership and earnings informativeness. Using data from Singapore and Spain respectively, they find that managerial ownership is positively associated with earnings informativeness only at lower levels of managerial ownership. At higher levels of managerial ownership, the entrenchment effect sets in and the relationship reverses to a negative one.

With respect to other aspects of ownership structure, there has also been some focus on ownership concentration, institutional investors and blockholders. For example, Fan and Wong (2002) argue that earnings are less informative in firms with concentrated ownership because the credibility of earnings is reduced as minority shareholders suspect that controlling shareholders would manipulate earnings for their self-serving interest. Moreover, concentrated ownership in regions such as Asia, which they study, may also

be for the purposes of concealing firm-specific knowledge from competitors, which ultimately results in greater opaqueness and less earnings informativeness. In terms of institutional investors, Jung and Kwon (2002), assert that earnings are more informative in firms with more institutional shareholders and blockholders, consistent with the view that these type of shareholders have a greater incentive to monitor managers effectively in order to bring about greater transparency of relevant accounting disclosures.

Another strand of the empirical literature on earnings informativeness has also examined the impact of firm size (Atiase 1985, Bamber 1987, Freeman 1987, Ro 1988, Atiase et al. 1989). The general consensus from these studies is that market reactions to earnings announcements are more pronounced in smaller firms that in larger firms. Atiase (1985) provides one of the pioneering works on the impact of firm size on earnings informativeness by arguing that compared to smaller firms, there is a greater incentive for information agents to collect and generate more private and public information about larger firms, even ahead of the disclosure of annual earnings. Consequently, investors are likely to be more interested in the earnings of smaller firms since relatively little is known about these firms prior to earnings announcements. Indeed, Atiase et al. (1989) argue further that the size effect mitigates the delay effect in that, whilst delayed earnings announcements would be expected to trigger smaller market reactions, this relationship is reversed when the firms in question are small in size. Thus, although big firms disclose their earnings information much earlier than small firms, they still trigger smaller market reactions compared to smaller firms. These conclusions on firm size are however contrasted in a much later study by Chan et al. (2005), who investigate a sample of Australian companies and find that firm size effect is either non-existent or positive for Australian firms. They attribute this to the size of the Australian market and the lack of analyst following which implies that smaller firms below a certain threshold would be operating in a highly poor information environment and would therefore not generate any market reactions to their earnings. It is however important to mention that, most recent studies of earnings informativeness continue to observe a negative co-efficient for firm size in multivariate analyses of the measures of earnings informativeness (eg. Pevzner et al. 2015, Landsman et al. 2012)

Finally, Zhang et al. (2013) attribute the market reaction to earnings news to the impact of information risk and transaction costs among firms. They argue that information risk increases the relative significance of public news announcements which

makes traders react more strongly. Thus the initial market reaction to earnings announcements is greater for higher information risk firms. On the other hand, transaction costs, which are partly induced by information risk, mitigate the initial market reaction to earnings leading to higher subsequent post-earnings announcement drift.

3.3.2.4 Post-earnings announcement drift

According to Hung et al. (2014 p.1), Post Earnings Announcement Drift or PEAD is "a significantly positive relation between currently announced earnings surprises and subsequent stock returns". It is arguably one of the strongest anomalies that challenge the principle of market efficiency (Fama 1998). Thus it can be logically argued that the existence or otherwise of Post Earnings Announcement Drifts provides evidence of the extent to which markets can be efficient. A major factor that explains the phenomenon of Post-Earnings Announcement Drift is that it reflects a delayed response to earnings information (Bernard and Thomas 1989). They argue that this delay in response is largely due to the presence of investors who fail to understand and appreciate the full implications of earnings news. As a result, such investors are not able to form objective expectations of future earnings immediately when current earnings information becomes available. To confirm this, Bartov et al. (2000) find that institutional holdings are negatively associated with post earnings announcements reactions. They use institutional holdings data as a proxy for how well a firm's owners can understand and process information. They conclude that post-earnings announcement drift and the general predictability of returns is explained by the presence of unsophisticated investors who are not likely to fully appreciate earnings information.

Again, the literature proposes that Post Earnings Announcement Drift is influenced by mispricing in the market (Bernard and Thomas 1989). This mispricing is evident in the underreaction to earnings news due to such factors as limited arbitrage (Shleifer and Vishny 1997). Studies such as Mendenhall (2004) find that Post Earnings Announcement Drift is higher in firms with greater limits to arbitrage. But in an interesting twist, Hung et al. (2014) argue that PEAD can also be higher when there are lower limits to arbitrage. This happens when the abundance of firm specific information sends irrelevant signals and causes investor inattention. They make this claim because, in their view. Post Earnings Announcement Drift is "an equilibrium outcome of various factors that are

jointly determined by a country's institutional environment, which can affect PEAD in opposite directions" (p.2).

Post Earnings Announcement Drift has sometimes been attributed to market anomalies in financial markets that arise from behavioral biases among market participants (Liang 2003). Two popular models that have been put forward in this regard are found in Barberis et al. (1998) and Daniel et al. (1998). Barberis et al. (1998), using two judgment biases- representativeness and conservativeness, argue that investors underreact or overreact to earnings changes because they place too much emphasis on recent patterns in data or are slow to change their models in the light of new information.. Daniel et al. (1998), on the other hand, use overconfidence and self-attribution bias to argue that investors have incomplete reactions to earnings announcements. This means that prices react and continue to change in the same direction during the post-event period as the event period. According to Fama (1998), although the above two models are premised on different behavioral factors, they make similar predictions.

3.3.3 Institutional development

This section discusses the concept of institutional development, particularly highlighting the two measures of institutional development examined in this thesis: IFRS adoption and corruption. It also discusses the links between institutional development and earnings informativeness.

3.3.3.1 Meaning and measures of institutional development

There is rarely a single definition that captures the essence of institutional development in its entirety. Israel (1987), however, explains institutional development as where the ability of institutions to make effective use of both human and financial resources is enhanced. Buyck (1991) adds to this definition by asserting that institutional development is not only limited to the building and strengthening of institutions but also includes rationalisation of costs and expenditures to fully achieve development objectives. But operationally, institutional development is demonstrated in the improvement of public financial management, internal organisational structures, inter-institutional relationships, the legal framework and government regulations and procedures (McGill 1996). Further and equally importantly, institutional development is also viewed from the perspective of

the quality of property rights, the proper functioning of financial markets and how these help to allocate resources efficiently (Acemoglu et al. 2005). One of the obvious conclusions in the literature on institutional development is that institutional development is lower in less developed countries than in developed ones. Countries with higher institutional development tend to have more open, trustworthy and transparent institutions (Shaner and Maznevski 2011). Chapter 7 of this thesis focuses on how two important aspects of institutional development, the adoption of IFRS and corruption impact the informativeness of earnings. But it's necessary to provide an explanation of how they constitute institutional development.

IFRS Adoption

The adoption of IFRS represents an aspect of institutional development because accounting standards in various jurisdictions are also influenced by the political, economic and social factors related to those jurisdictions (Lasmin 2011). One of the main objectives for introducing IFRS was to enhance the quality and comparability of accounting information across firms and countries (Hail 2010). IFRS adoption allows for the application of a single set of high-quality standards (Florou and Kosi 2015). Therefore, a transition from local accounting standards, which could be easily influenced by poor political and economic factors, to a set of single high-quality standards that have a wider global acceptability, may be an important first step in ensuring an improvement in the accounting system. The improvement in the comparability of financial statements by countries that adopt IFRS has been confirmed in studies such as Yip and Young (2012). Another aspect of IFRS adoption which makes it a matter of institutional development is the concept of enforcement. The enforcement of these standards can only succeed if mandated institutions, tasked with the responsibility of ensuring compliance, function effectively. The quality of institutions with respect to their ability to effectively enforce, provides perhaps the greatest source of variation in the implications and benefits of IFRS across countries. It is therefore not surprising that most studies that have investigated the impact of IFRS on such factors as liquidity (Christensen et al. 2013); (Landsman et al. 2012); cost of capital (Daske et al. 2008) and earnings quality (Houqe et al. 2012), all posit that the positive implications of IFRS adoption for these firm outcomes can only be realised if there is effective enforcement, backed by strong institutions.

Corruption

As a concept, corruption is quite hard to define. But a largely consensus definition of corruption has to do with how people in authority use their position and power for personal and other selfish gain (Drobetz et al. 2010). Jain (2001) identifies three ways by which corruption can manifest. The first relates to corruption whereby political executives exploit their power by altering national policies to serve their selfish interests. The second is where public bureaucrats including the judiciary and other law enforcement agencies try to extract private benefits in their dealings with others. The third and final leg is where the voting and decision-making behaviour of legislators can be influenced unethically to achieve an outcome desired by special interest groups. Corruption represents an important aspect of institutional development because it is also an indication of the strength of a country's political, legal and economic institutions (Svensson 2005). It therefore arises and thrives when there is the presence of weak institutions that are susceptible to bribes (Djankov et al. 2002). It is important to also mention that when it comes to corruption, the emphasis, and perhaps justifiably so, has always been on the public sector. However, corruption can also occur in the private sector through collusion between firms or misuse of corporate assets that hurt the interest of consumers and shareholders (Svensson 2005). Most of the empirical studies on corruption have focused on its impact on country-level outcomes such as economic growth (eg. Mauro 1995, Mo 2001, Ehrlich and Lui 1999), foreign portfolio investment (Knill 2013) and foreign direct investment (eg. Habib and Zurawicki 2002, Egger and Winner 2005, Voyer and Beamish 2004). At the firm level, the impact of corruption has focused on corporate liquidity (Chen 2011), cash holdings (eg. Smith 2016, Thakur and Kannadhasan 2019), and corporate misconduct (Liu 2016).

3.3.3.2 Institutional development and earnings informativeness

Cross-country studies of the market reactions to earnings announcements reveal substantial variation between countries. These differences have mostly been attributed to different aspects of institutional development. Griffin et al. (2011) examine market reactions to earnings in an international sample and find that firms in countries with better news transmission mechanisms, stricter insider trading laws and better accounting quality have more informative earnings. Bhattacharya et al. (2000) argue that since insiders trade on private information, prices are likely to incorporate value relevant information before such information is made public which ultimately leads to fewer or no market reactions to firm announcements. Given the lack of new information in such cases, market reactions

would be expected to be small. Consistent with this view, DeFond et al. (2007) also find that in countries with stronger enforcement of insider trading laws and general investor protection mechanisms, earnings announcements have greater information value.

Another influence of the information content of earnings is the quality of the financial reporting system. Landsman et al. (2012) find that the information content of earnings increased after the mandatory adoption of International Financial Reporting Standards (IFRS). Similarly, firms in IFRS adopting countries exhibit greater information content of earnings when compared to non-IFRS adopting countries. The effect becomes more pronounced when IFRS adoption is combined with strong enforcement of regulations. Landsman et al. (2012) further suggest that the informativeness of earnings after the adoption of IFRS is driven by the reduction in the reporting lag, increased analyst following and increased Foreign Direct Investment.

Pevzner et al. (2015) examine international differences in the information content of earnings and find trust to be an important determinant of how investors react to corporate earnings announcements. Although there are different dimensions of national culture that explain market reactions to firm disclosures, Pevzner et al. (2015) identify trust as the most significant because it fundamentally underpins many economic transactions. They argue that trust is positively associated with investors' reactions to corporate earnings announcements. For countries with weaker investor protection mechanisms and disclosure requirements, the relationship between trust and market prices is more pronounced as trust could substitute for more formal mechanisms.

3.3.4 Studies of market efficiency in Africa

Most studies of market efficiency in Africa have been limited to testing of the weak form. In a study conducted to assess the informational efficiency of stock markets of seven Middle Eastern and North African countries (MENA) which included Egypt, Morocco, and Tunisia, Lagoarde-Segot and Lucey (2008) find that three of these markets were not as weak-form efficient as the remaining four countries which were non-African countries. Using a combination of random walk tests and technical trading rules, they find that stock market size and liquidity had a significant explanatory power on how efficient markets were, which are consistent with the findings of Smith (2008) who uses a sample of eleven African countries. Smith et al. (2002) use variance ratio analysis for a sample of eight

African countries and find that with the exception of South Africa, all markets in the sample exhibit serial correlation in their indexes which is inconsistent with the weak-form of market efficiency. These results are consistent with those of Nwosu et al. (2013) although Nwosu et al. (2013) argue that the South African market is equally weak-form inefficient. Ntim et al. (2007) find no evidence of weak-form efficiency in Ghana. In a subsequent study Ntim et al. (2011) do not find evidence of weak form efficiency in a sample of eight national stock indices including Ghana. However, when compared to continent-wide indices, they find evidence of weak form efficiency.

The low level of efficiency of many African stock markets has been attributed to factors that prevent the flow of information and some institutional underdevelopment (Lagoarde-Segot and Lucey 2008). For example, in many of the most developing countries, there is a lack of market markers mainly as a result of government interference in economic activities. Again, short selling in most markets is not permitted due to low disclosure requirements (Appiah-Kusi and Menyah 2003). Chordia et al. (2005) further argue that liquidity hinders the ability of the market to accommodate orders whilst Magnusson and Wydick (2002) assert that dominant players could arise in markets with low competition who could cause movements in stock prices at the expense of less dominant players. Yartey and Adjasi (2007) also attribute the level of efficiency to a relatively higher number of poorly informed investors and poor regulatory framework. Another characteristic of African stock markets which impedes efficiency is the problem of thin trading.

Thin trading is a potential source of serial correlation among stock returns which leads to the rejection of the weak-form hypothesis (Appiah-Kusi and Menyah 2003). Unlike most other studies, they adopt a non-linear approach to testing the weak-form efficiency of eleven African stock markets. Their rationale for adopting such an approach was that investors sometimes overact to bad news and underact to good news, which could cause non-linearity in stock returns. After accounting for thin trading in their model, they find that six of the eleven markets are inefficient.

Table 3.1 presents a summary of the main studies of weak form efficiency in African stock markets. The table also shows the various methodologies that were used in arriving at the conclusions across each of the countries involved.

Table 3.1: Summary of studies of market efficiency in African markets

PANEL A. STUDIES THAT DO NOT FIND AFRICAN STOCK MARKETS TO BE WEAK-FORM EFFICIENT											
Study	**Methodology**	Botswana	Tunisia	Egypt	SA	Kenya	Nigeria	Ghana	Mauritius	Zimbabwe	Morocco
Magnusson and Wydick (2010)	Autocorrelation							✓		✓	
Jefferis and Smith (2005)	Garch with time-varying properties					✓			✓	✓	
Segot and Lucey (2008)	Unit roots test and variance ratio test		✓	✓							✓
Nwosu et al (2013)	Autocorrelation, unit root test and			✓	✓	✓	✓				
Simons and Laryea (2006)	Autocorrelation and Variance ratio test			✓				✓	✓		
Appia-Kusi and Menyah (2003)	Non Linear GARCH Model	✓			✓			✓			
Ntim et al(2011)	Variance ratio tests	✓	✓	✓		✓	✓	✓	✓		✓
PANEL B. STUDIES THAT FIND AFRICAN STOCK MARKETS TO BE EFFICIENT											
Study	**Methodology**	Botswana	Tunisia	Egypt	SA	Kenya	Nigeria	Ghana	Mauritius	Zimbabwe	Morocco
Magnusson and Wydick 2010	Autocorrelation	✓			✓	✓	✓		✓		
Jefferis and Smith 2005	Garch with time-varying properties			✓	✓		✓				✓
Simons and Laryea (2006)	Autocorrelation and Variance ratio test				✓						
Appia-Kusi and Menyah (2003	Non-Linear GARCH Model			✓		✓			✓	✓	✓

A number of studies, however, find that African stock markets are weak form efficient. For example, Magnusson and Wydick (2002) find evidence of weak form efficiency for six out of eight African countries in their study, although they add that for these six countries, it might be possible to predict volatility based on past prices. This implies that such countries only meet a minimum hurdle for being weak form efficient, i.e. only returns cannot be predicted from past price information. Jefferis and Smith (2005) also test the efficiency of African stock markets. Unlike other studies, they adopt a GARCH model with time-varying parameters, allowing them to ascertain whether the efficiency of stock markets evolved during their sample period (1990-2001). They find that the South Africa market remained efficient throughout the period whilst the Egypt, Morocco, and Nigeria evolved from being inefficient to being efficient over time. However, the remaining three markets (Kenya, Mauritius and Zimbabwe remained inefficient throughout the period.

3.4 Research gaps and linkages

From the review of the extant relevant literature, a number of gaps have been identified which this thesis aims to fill. Firstly, the counter argument provided by Dasgupta et al. (2010) that stock return synchronicity can be high in a strong information environment provides an avenue to conjecture as to whether the reverse may be observed in a weak information environment. African countries provide a useful setting for this analysis, not only because of the dearth of studies of stock return synchronicity in these markets but also (and as already identified in Chapter 1), they bear characteristics that make them underdeveloped. Therefore, the first empirical analysis of this thesis, contained in Chapter 5, investigates the level of stock return synchronicity in the sample of African markets and also seeks to ascertain the factors that help to explain variations in stock return synchronicity among firms in each of these countries.

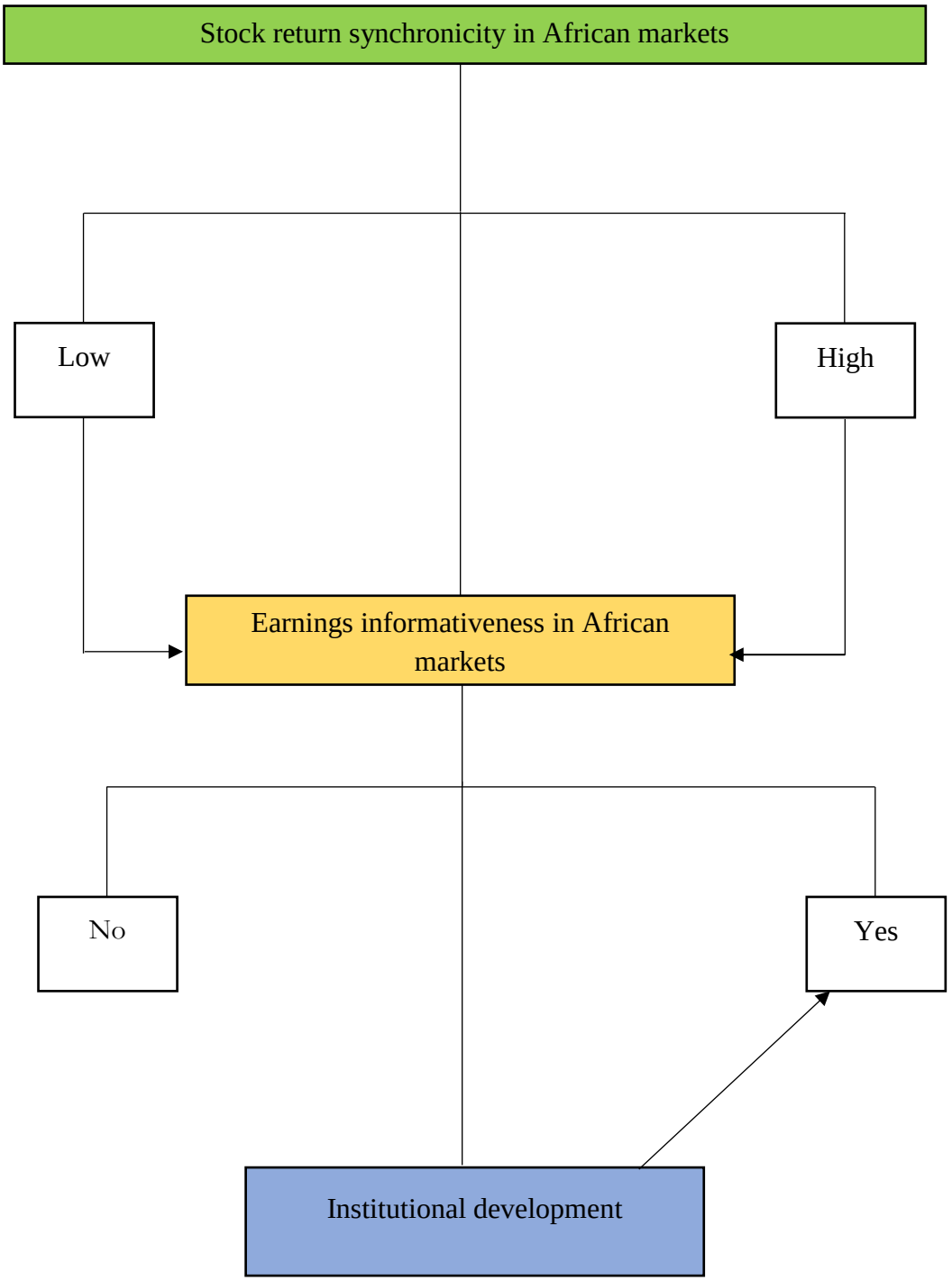
Secondly, and as shown from the literature review, most studies of market efficiency in Africa have been confined to weak form tests. Although the findings have been mixed, this appears to be due to differences in methods and time periods. But as African countries continue to improve the operational capacity of their stock markets through the adoption of automated trading systems and reducing settlement times, it is timely to carry out a more extensive analysis of whether markets indeed react to corporate information such as earnings, given their level of stock return synchronicity. As already mentioned earlier, the few studies of semi-strong efficiency in African markets that have

examined the market reactions to corporate events, including earnings announcements, have been constrained by the lack of sufficient data. The second analysis of this theses, contained in Chapter 6, uses a larger set of annual earnings announcements and a variety of measures to investigate the informativeness of earnings announcements in the sample of African markets.

Finally, and as already identified, most studies that have examined the capital market benefits of IFRs adoption, including earnings informativeness, argue that these capital market benefits can only be realised in the presence of strong enforcement. Most of these studies however to not study countries with weak enforcement exclusively. Further, although many studies have studied the relationship between country factors and earnings informativeness in both developed and developing markets, the impact of corruption which may be of particular importance to African countries, is still developing. Only Haw et al. (2012) attempt to account for corruption by including a corruption proxy in the construction of an index when determining the impact of investor protection on stock price informativeness of future earnings. The third and final analysis of this thesis, contained in Chapter 7, investigates role of institutional development on earnings informativeness by focusing on the adoption of IFRS and the perception of corruption.

Although the empirical analyses conducted to address the above research gaps are separate, they are also interrelated. Figure 3.2 provides a framework that shows the inter-relation between stock return synchronicity, earnings informativeness and institutional development. As can be observed from the figure, this thesis begins by first determining the level of stock return synchronicity. A low and high level of stock return synchronicity should have some implications for earnings informativeness. Whilst a low level of stock return synchronicity would ex-ante suggest that earnings would be informative, a high level of stock return synchronicity would ex-ante suggest the opposite. Establishing some level of earnings informativeness leads to an investigation as to whether the level of institutional development, reflected in the adoption of IFRS and the perception of corruption, plays a role in how market participants react to earnings announcements.

Figure 3.2: Framework of analysis



3.5 Summary

This chapter has provided a review of the theoretical literature underpinning the thesis. It has also provided a review of the relevant empirical literature highlighting on the three key strands of stock return synchronicity, earnings informativeness and institutional development. The review of both the theoretical and empirical literature presented here shows that the informational efficiency of stock markets is of key significance to investors and other market participants. However, differences in institutional settings of various countries, reflected in investor protection, corporate governance, and economic development are equally germane in accounting for variations in the informational efficiency of stock markets and the ability of stock prices to incorporate firm specific information. Based on this literature review, the research gaps have been identified. Further, a framework has been provided to illustrate how the three strands, although separate, are interrelated. The next chapter discusses the data and also gives an overview of the research methodologies that have been used to address the research questions of this thesis.

Chapter 4

Data and Overview of Methodology

4.1 Introduction

This chapter provides a description of the data used in the study and gives an overview of the methods used to answer the research questions. The chapter begins with a description of data sources and the screening procedures used to arrive at the final sample for analyses. Details of how variables are constructed are also provided. The rest of the chapter is organised into four sections. Section 4.2 gives details of how the sample of African firms was obtained. Section 4.3 describes the sources of the data. Section 4.4 explains how the variables used in each of the three empirical analyses are constructed. Section 4.5 provides an overview of the various methodologies used for answering the research questions.[4]

4.2 Sample selection

The sample selection process of firms began with the compilation of a list of all listed companies in each of the five countries (Botswana, Ghana, Kenya, Nigeria and South Africa) from Datastream. In order to address concerns about survivorship bias, the list is made up of both active and dead companies. In all, a total list of 1801 companies was initially obtained from the five countries.

The sample period selected is 2005-2015. The choice of this period is motivated by the need to examine the impact of recent structural improvements in most African stock markets could have had on informational efficiency and price discovery. As stated in Chapter 2, most African stock markets now have electronic and automated trading systems. For example, Nigeria introduced automated trading systems in 1999. Ntim et al. (2011), however, argue that the introduction of such mechanisms could take some time before their impact can be felt. On that basis, a sample period beginning in 2005 is considered to be appropriate. Further, although the introduction of automated trading systems in Botswana and Kenya took place after 2005, there were other significant developments that took place during the sample period, such as the increase in the number

[4] More detail is provided on specific aspects of the methodology in the respective empirical chapters.

of trading hours. Taken all these together, the choice of 2005-2015 is suitable for the purpose of this study.

In the process of collecting (downloading) data on the accounting variables, some firms did not return any data at all, and are therefore excluded. Where data is available for any given variable, the observation was maintained within the sample. This resulted in a total of 616 unique firms and 4,728 firm-year observations for whom data can be obtained for at least one variable. Table 4.1 presents a breakdown of the number of firms by country and industry. Industry classification is done according to the Industry Classification Benchmark (ICB) of the FTSE International. The ICB classifies firms into 10 industries. The number of firms in the sample for each country reflects the size of the market as shown in Table 2.2 in Chapter 2. South Africa has the largest number of firms in the sample (404). It is followed by Nigeria, Kenya and Ghana which have 121, 49 and 27 respectively. Botswana has the smallest number of firms (15). The empirical analysis is generally carried out on a country by country basis although, in some cases, a combined sample is used. Given the disproportionately higher number of firms in the South African sample relative to other countries, separate models are generally presented for South Africa and the rest of the sample. Consequently, the number of observations for some models is small for some markets. Table 4.1 also shows that in each country the industry with the highest number of firms is the financial industry. Also South Africa is the only country in the sample to have at least one company in each of the 10 ICB industry groups.

The inclusion of financial companies in the sample is done because although financial companies are generally regarded as more heavily regulated than other firms, the framework which provides for the disclosure of corporate information to enhance the stock price discovery process for listed companies apply equally to both financial and non-financial firms. For example, in Chapter 2, the listing rules and companies Acts which require listed firms to disclose information that may be material to the value of its stock do not really discriminate between financial and non-financial firms. Thus, the extra regulation that financial companies may experience would not necessarily be one that would impact on stock return synchronicity and earnings informativeness. Also the non-exclusion of financial firms is consistent with some studies of both stock return

Table 4.1: Distribution of firms

This table presents the distribution of firms by country and industry for the sample period 2005-2015

	Botswana N= 15		Ghana N=27		Kenya N=49		Nigeria N=121		South Africa N=404	
	Number	%	Number	%	Number	%	Number	%	Number	%
Basic Materials	1	6.7	2	7.4	1	2.0	9	7.4	61	15.1
Consumer Goods	3	20.0	6	22.2	14	28.6	22	18.2	33	8.2
Consumer Services	1	6.7	1	3.7	6	12.2	7	5.8	45	11.1
Financials	8	53.3	10	37.0	17	34.7	46	38.0	112	27.7
Health Care	-	-	2	7.4	-	-	4	3.3	11	2.7
Industrials	1	6.7	2	7.4	5	10.2	22	18.2	102	25.3
Oil & Gas	-	-	3	11.1	2	4.1	7	5.8	2	0.5
Technology	1	6.7	1	3.7	1	2.0	2	1.7	31	7.7
Telecommunications	-	-	-	-	1	2.0	2	1.7	6	1.5
Utilities	-	-	-	-	2	4.1	-	-	1	0.3

Source: Datastream and author's computations

synchronicity (eg. Chan and Hameed 2006, Feng et al. 2016) and earnings informativeness (eg. Griffin et al. 2011, Landsman et al. 2012, Pevzner et al. 2015). This can therefore help to facilitate a more meaningful comparison of the results of this study with those of previous studies. However, to ensure that results are not biased by the inclusion of financial firms, they are also later excluded in the cross sectional regressions in Chapter 5 (see Appendix 5.3 of chapter 5). The results provided in the appendix show that the inclusion of financial companies in this study is not problematic as both results are very much the same.

4.3 Data sources

This section provides a description of the sources from which data were obtained.

4.3.1 Firm-level data (stock returns and accounting data)

All firm-level data are obtained from Datastream. These include stock returns and firm financial data (accounting variables).[5] Daily stock returns (excluding weekends) are used. Both general and country-specific holidays are also excluded by referring to the holidays' Acts of the countries in the sample and verifying that the stock markets do not operate on such days. In some countries, when a holiday falls on a weekend, the next working day is made a holiday. Where this is the case, such working days are equally excluded. Panel B of Appendix 4.2 presents analyses of a panel unit root tests of firm stock returns for each country, which shows that stock returns are largely stationery.

4.3.2 Earnings announcement dates

Annual earnings announcement dates between 2005 and 2015 are obtained from Thomson Reuters Datastream.[6] A total of 4,088 earnings announcements across the five countries (Botswana, Ghana, Kenya, Nigeria and South Africa) was initially obtained. However, 17 of these firms which together generated 81 announcements over the period

[5] Accounting variables for all firms in each country are collected in US $ for more meaningful comparison.

[6] This is a data type called Earnings Report Date – Fiscal Period End. It is the source date for the earnings reported by the company for the corresponding period. Due to availability constraints we are unable to obtain announcements dates from Bloomberg and I/B/E/S as done in some previous studies. However, a number of earnings announcements which were obtained from the websites of some of the countries' stock markets matched the dates obtained from Datastream, and we are therefore certain of their accuracy.

did not have return data at all. As such these announcements and their corresponding firms were dropped. A further 16 announcements were dropped due to contamination (confounding events). These confounding events were detected when trying to cross check the Datastream earnings announcements dates from corporate releases published on the stock exchange websites of countries in the sample. Most studies that employ an event study methodology try to preserve the integrity of their sample by excluding wherever, possible, other events that occur around the same time as the event of interest (Fox and Opong 1999, Jones et al. 2004) . This resulted in a sample of 3,991 annual earnings announcements.

One major feature of most developing stock markets, particularly those in Africa, is the problem of thin trading and illiquidity (Mlambo and Biekpe 2005). However, in order to capture the impact of information on stock prices, it is desirable that stocks are actively traded as the problems of thin trading and illiquidity could have negative implications for any model of abnormal computing returns (Strong 1992). For an announcement to be selected for analysis in this study, a procedure used by Griffin et al. (2011) was adopted. This required the corresponding stock to have price changes in at least 50% of the trading days in the prior year. This measure of liquidity was introduced by Bekaert et al. (2007) and is less subject to estimation problems than other measures of liquidity due to its straightforward nature. After applying this filter, trading by firms in two of the sample countries (Botswana and Ghana) was insufficient to pass the threshold for inclusion in the final sample. Hence the remaining sample comprised data from the three remaining African countries. The surviving sample comprised 1,762 earnings announcements from companies in Kenya, Nigeria and South Africa. Although this approach results in a reduction in sample size in terms of both announcements and countries, the final sample provides a more appropriate basis to examine how stock prices react to corporate information in these markets.

Bartholdy et al. (2007) study how event studies can be conducted in small markets and recommend that results should be presented separately for highly traded stocks and less traded stocks. Consistent with this approach, the selected announcements are split into categories by using thresholds of the percentage of non-zero returns. These categories are highly traded stocks (HTF) which includes announcements where the corresponding stocks had a price change on at least 75% of trading days in the previous year and medium traded stocks (MTV) representing announcements where the corresponding stocks had a price change on between 50% and 75% of the trading days in the previous year.

It is important to note that because most firms have more than one earnings announcement in the sample, the classification is conducted in relation to the announcements and not firms. This implies that, in respect of any particular announcement, a firm could be regarded as either HTF or MTF depending on its threshold of non-zero returns in the year prior to when the announcement in question was made. Table 4.2 presents the number of announcements by country and year whilst Table 4.3 presents the number of announcements according to trading frequency categories.

Table 4.2 Number of earnings announcements

This table presents the number of earnings announcements by country and by year.

Year	Country			
	Kenya	Nigeria	South Africa	Total
2005	3	1	77	81
2006	8	5	120	133
2007	16	15	130	161
2008	24	14	149	187
2009	29	9	158	196
2010	29	12	130	171
2011	32	45	128	205
2012	33	28	123	184
2013	22	29	119	170
2014	28	32	140	200
2015	17	28	29	74
Total	241	218	1303	1762

Source: Datastream and author's computations

Table 4.3 Earnings Announcements by country and by price changes

This table presents the number of earnings announcements categorized according to price changes in the previous years (percentage of non-zero returns in the previous year). ≥75% represents announcements where the concerned firms had a price change in at least 75% of trading days in the previous year. 50%-74% represents announcements where the concerned firms had a price change of between 50% and 74% of trading days in the previous year

Country	Category		
	HTF	MTF	TOTAL
Kenya	19	222	241 (14%)
Nigeria	36	182	218 (12%)
South Africa	133	1170	1303 (74%)
TOTAL	188 (11%)	1574 (89%)	1762

Source: Datastream and author's computations

4.3.3 Ownership data

Ownership data, on a yearly basis over the sample period, is collected from the Osiris database. This database provides ownership and financial information for over 55,000

firms across the world. For each company, a list of all shareholders and the percentage of shares directly held is provided. Further, for each shareholder, an indication of the type of shareholder (i.e banks, mutual funds, government agency) is given. This makes it possible to classify shareholders into different categories such as institutional shareholders or government shareholders. With this raw data, ownership variables are then generated in Stata. These are then matched with data obtained from Datastream.

4.3.4 Country-level data

At the country level, data on return indices are also collected from Datastream. For each country, the S&P Broad Market Index (BMI) is used. These indexes are computed based on domestic publicly listed companies to reflect at least 80% of the domestic market subject to size and liquidity criteria. Return indexes account for dividends and as such reflect a better measure of performance. Panel A of Appendix 4.2 and Appendix 4.3 present unit root test results of stock indices and time series plots of stock indices respectively. Data on the quality of auditing and reporting standards are obtained from the Global Competitiveness Index report, which is constructed based on a survey conducted by the World Economic Forum in conjunction with partner institutions in the various countries. Annual scores on perceptions of corruption are obtained from Transparency International which is an international body that conducts surveys on corruption across countries. Details of corruption data and data on auditing and reporting standards are discussed further under section 4.4.3 of this chapter.

4.4 Variable construction

This section of the chapter explains how both dependent, explanatory and control variables are constructed. The section is further divided into three parts. Section 4.4.1 provides details of the variables used in the first empirical analysis of the thesis which focuses on ascertaining the level and determinants of stock return synchronicity in the sample markets. Section 4.4.2 defines the variables used in the second empirical analysis which investigates the informativeness of earnings and whether earnings informativeness is influenced by trading frequency or the fundamentals of the firm. Section 4.4.3 provides details of the variables used in the third and final analysis, which examines the impact of institutional development on earnings informativeness.

4.4.1 Stock return synchronicity in African markets

The objective of this analysis is to examine the level of stock return synchronicity and to ascertain the main determinants of stock return synchronicity among firms in African markets.

4.4.1.1 Dependent variable

Synchronicity

The main measure of firm level synchronicity in previous studies is the R^2 of a regression of stock returns on a market index which determines the variation of stock returns explained by variations in market returns (eg. Morck et al. 2000, Gul et al. 2010, Chan and Hameed 2006). This implies that $1 - R^2$ represents the variations of stock returns explained by information relevant to the firm itself. Typically R^2 is obtained from the regression equation below:

$$R_{it} = \alpha_{it} + \beta_i RM_t + \varepsilon_{it} \qquad 4.1$$

Where R_{it} is the stock return for firm i in period t and RM_t is the market return in period t. Studies such as Piotroski and Roulstone (2004) include industry indices in the estimation of the above equation to determine synchronicity. But as argued by Chan and Hameed (2006), including an industry index is problematic in the case of developing and emerging markets because these markets are usually dominated by few industries and thus disentangling the industry effect from the market effect becomes difficult. They further argue that industry returns are more likely to reflect firm-specific information rather than industry information when the industry is made up of a few firms. Moreover, in this study, data on industry indices for countries in the sample is hardly available.

The computation and interpretation of R^2 implies that it is bounded within an interval of [0, 1]. Typical of most studies, this measure of synchronicity is logistically transformed to in order to circumvent the challenge of using it as a dependent variable. Synchronicity is thus computed as:

$$Synchronicity = log\left(\frac{R^2}{1-R^2}\right) \qquad 4.2$$

For robustness purposes in Chapter 5, synchronicity is also computed by including the lagged market index and a world market index.

4.4.1.2 Independent variables

Firm Size

Firm size is measured as the natural logarithm of the market value of equity, consistent with Chan and Hameed (2006), Boubaker et al. (2014) and Pevzner et al. (2015). Some studies, however, use the natural logarithm of total assets (Gul et al. 2010, Hasan et al. 2014). A recent study by Dang et al. (2018) compares the three most widely used measures of firm size in the finance literature namely: total assets, total sales and market value. They posit that different measures of size capture different characteristics about the firm and will therefore have different implications, whether as a key variable or a control variable. For instance, they argue that total assets is more suitable for measuring size when one intends to capture the resources available to the firm. Total sales is more appropriate when one aims to measure size in relation to the product market competition of the firm. Market value however is more advantageous when measuring size in relation to the equity market conditions of the firm. Based on this premise, the choice of market value as a proxy for firm size is appropriate for this study. Following Pevzner et al. (2015), market value at the beginning of the year is used. Shares of larger firms are more frequently traded compared to smaller firms (Roll 1981). Based on this, one may expect stock prices of larger firms to incorporate more specific information and be less synchronous. However, studies such as Roll (1988) observe a positive relationship between firm size and stock price synchronicity implying that the prices of larger firms do not incorporate firm-specific information.

Age

Age is computed as the difference between every current firm-year and the Base date of the firm in Datastream (Guest 2009, Galema et al. 2008, Kohl and Schaefers 2012). The base date is the date on which a firm is first listed in Datastream. For most firms, this is the date when the firm became public. This measure is quite similar to other standard proxies of firm age used in the literature including; the number of years since a firm's incorporation (Oswald and Zarowin 2007), and number of years since a firm's initial public offering (Dasgupta et al. 2010). It is therefore highly unlikely that a younger publicly listed firm will have an earlier base date in Datastream than an older one.

Leverage

Leverage is measured as the ratio of total debt to total assets (Fama and French 2002, Leary and Roberts 2005). Total debt is computed as the sum of short term debt and long term debt. From an agency theory and governance perspective, Rajan and Zingales (1995) argue that total debt is a more suitable measure of debt as it is not affected by non-financing components. Given that this sample includes a mixture of financial and non-non-financial companies, this measure is suitable. Most studies involving only financial companies usually use the ratio of total liabilities to total assets (Nguyen et al. 2015, Hagendorff et al. 2018). However, given that total debt is a subset of total liabilities, it makes for a more meaningful comparison of both financial and non-financial firms. But as earlier indicated, the inclusion of financial firms does not bias the results of the empirical analyses since the same results are obtained when financial firms are excluded. With regards to its potential impact on synchronicity, leverage transfers more value of the firm from equity holders to debt holders. On that basis, firms with higher leverage can be expected to be less responsive to corporate information in general and earnings in particular. However, Hutton et al. (2009) argue that the risks transferred from equity holders to debt holders are of an idiosyncratic nature which makes firms with higher leverage less synchronous. Further, Rajgopal and Venkatachalam (2011) argue that stock returns of firms with greater leverage are more volatile due to higher financial distress.

Profitability

Profitability is measured as operating profit scaled by total assets (Liu 2016, Liu et al. 2017). This measure of profitability signals the ability of a firm to generate income from normal and routine business activities. There is a strand of literature which argues that firm stock returns are influenced by profitability (Balvers et al. 2017, Hirshleifer et al. 2017). Based on this understanding, we can expect profitability to also have an impact on synchronicity. Indeed, Dasgupta et al. (2010) find a positive relationship between profitability and synchronicity.

Non-Zero Return Days

Non-Zero Return Days is measured as the number of days a firm has a non-zero return divided by the total number of trading days in the year. This is used as an indication of liquidity (Lesmond et al. 1999). Although there are other measures of liquidity such as turnover (Rouwenhorst 1999) and the ratio of daily absolute return to dollar trading value (Amihud 2002), Hearn and Piesse (2013) find that non-zero return days is a better

approach of capturing liquidity in a sample of African countries which include all the countries used in this study. Furthermore, Lesmond (2005) argues that this measure gives a comprehensive estimate of liquidity as it implicitly includes spreads, commission costs, a portion of expected price impact cost and a possible opportunity cost of informed trading.

Firms in Industry

This is computed as the log of the number of firms in the same industry in which a firm operates. Firms in Industry is used in Chapter 5 to control for the differences in synchronicity that may have arisen from differences in the industry size in which firms operates (Durnev et al. 2003).

Trading Volume

Trading volume is computed as the natural log of the volume of shares traded of a firm in a given year (Devos et al. 2015, Feng et al. 2016). Trading volume affects the speed of stock price adjustments and it's therefore likely to affect stock returns (Chan and Hameed 2006). They further argue that returns of frequently traded stocks are more synchronous with market movements as they react to market information on a timely basis. On the other hand, returns of infrequently traded stocks result in lower stock return synchronicity.

Ownership structure variables

Four ownership structure variables are used to test how stock return synchronicity may be affected by the nature of corporate ownership: These are Top 5 Shareholders, Government ownership, Institutional Ownership and Families and Individuals. Top 5 shareholders is the percentage of shares directly held by the largest 5 shareholders of each company in a year and is used as a measure of ownership concentration (Prowse 1992, Hovey et al. 2003). Government ownership is computed as the percentage of shares directly held by Government or Government related institutions (Gul et al. 2010). This captures how state involvement in financial markets affects the informativeness of stock prices. Institutional Ownership is the percentage of shares directly held by Institutional Investors (An and Zhang 2013). Finally Individuals and Families is measured by the percentage of shares directly held by families and individuals.

4.4.2 Earnings informativeness: Fundamentals or trading frequency?

The objective of this chapter is to investigate the information content of earnings announcements and to determine whether earnings informativeness are influenced by fundamentals or trading frequency.

4.4.2.1 Dependent variables

Cumulative Abnormal Returns (CAR)

Abnormal returns are computed using a standard event study methodology which compare actual returns of a stock to expected returns relative to the event in question (Fama et al. 1969). This implies that the model of computing abnormal returns is crucial to an event study estimation. By far the most popular model has been the market model which is given as

$$AR_{it} = R_{it} - (a_i + \beta_i RM_t + \varepsilon_{it}) \qquad 4.3$$

Where α and β that are parameters usually obtained from an OLS regression of a firm's stock on its market index. One problem however with the market model is that there is a tendency for model parameters to be misstated and this problem becomes even more pronounced with the presence of thin trading (Armitage 1995). In this study, alphas and betas are found to be unrealistic when using market model estimation (see Appendix 4.6) Hence, in order to avoid this issue, the simpler index model (market-adjusted return model) is adopted where:

$$AR_{it} - RM_t \qquad 4.4$$

The abnormal returns are obtained by subtracting the market index return from the stock return. This model assumes ex-ante that expected returns for all securities are the same and thus helps to circumvent the misspecification of the market model parameters. Studies such as Strong (1992) and Brown and Warner (1985) argue that the index model, although a relatively simpler model, performs equally well as other models deemed to be more sophisticated. As part of preliminary analysis for the event study, Appendix 4.4 presents raw, index and abnormal returns across the main event window by year. Appendix 4.5 shows the average stock returns of firms over the main event window.

Abnormal Trading Volume (ATV)

As indicated in Chapter 3, trading volume provides a good reflection of the actions of investors around the announcement of a corporate event. Thus, revisions of investors' expectations resulting from the arrival of new corporate information would be expected to lead to more or less trading volume. The informativeness of earning is therefore also measured by abnormal trading volume (*ATV*), where ATV is computed as

$$ATV = \left(\frac{Average\ Trading\ Volume_{(-10,+10)}}{Average\ Trading\ Volume_{(-70,-11)}}\right) \qquad 4.5$$

Consistent with previous studies, trading volume in equation 4.5 is scaled by number of shares outstanding (DeFond et al. 2007, Landsman et al. 2012, Pevzner et al. 2015).

4.4.2.2 Independent variables

Earnings

Earnings is measured as the income available to common shareholders reported on DataStream. The reaction of a firm's stock price to earnings announcements could be influenced by the size of the earnings reported relative to the firm. Earnings is therefore computed. The early work of Beaver (1968) shows earnings as an important component of the valuation of a firm's common stock. This is especially true as the value of common stock is determined by future cash flows which primarily come from earnings. But as he observes, central to this relationship between earnings and stock returns is the fact that earnings should have information content. Thus in any framework for determining the informativeness of earnings, the relative magnitude of earnings could influence the market reactions associated with the release of earnings information. To account for the resources available to a firm in generating its income, the earnings variable is scaled by total assets.

Earnings Growth

Most studies of earnings informativeness measure change in earnings or earnings growth by comparing actual earnings to forecasted earnings by analysts. Using analyst forecasts is a widely accepted and appealing measure of capturing expected earnings as analysts incorporate a wider variety of useful and more meaningful information into their forecast and are also able to do so in a more timely fashion (Collins and Hopwood 1980, Imhoff and Pare 1982, Brown et al. 1987, O'brien 1988). However, due to the unavailability of obtaining analyst forecast data on African companies, earnings in the previous year are

used as an indication of what should be expected at the very least, and compared to current earnings in order to determine growth in earnings. Another alternative for determining expected earnings is is to employ statistical techniques of forecasting earnings such as the first-order autoregressive model of Foster (1977). However, unlike analyst forecasts, many factors may be neglected in this process and such forecasted earnings may therefore depart from the economic reality. Since the aim in this context is to determine how actual earnings reported will differ from what would otherwise be expected by investors, earnings growth is computed as:

$$Earnings\ Growth = Earnings_t - Earnings_{t-1} \qquad 4.6$$

Positive to Negative earnings /Negative to Positive

Positive to Negative is an indicator variable that equals 1 if earnings change from a positive earnings figure to a negative earnings figure and 0 otherwise. *Negative to Positive* is an indicator variable that equals 1 if the change in earnings is from negative to positive and 0 otherwise. These two dummy variables are constructed to help capture asymmetric reactions to changes in earnings. Bartov et al. (2002) and Kasznik and McNichols (2002) argue that there are differences in reactions between negative and positive surprises to earnings news. The change in earnings dummies may also indicate a behavioural response to the earnings news or a form of new information content.

Firm Size

Similar to the previous analysis, firm size is measured as the natural logarithm of the market value of equity, consistent with Chan and Hameed (2006), Boubaker et al. (2014) and Pevzner et al. (2015). This measure of firm size is considered appropriate for this analysis because it also characterises the firm in relation to its equity market condition Dang et al. (2018), which in this case, relates to earnings informativeness. Again and consistent with Pevzner et al. (2015), market value at the beginning of the year is used. The impact of firm size on earnings informativeness may either be negative or positive As already noted in previously, shares of larger firms are more frequently traded compared to smaller firms (Roll 1981). Based on this, one may expect stock prices of larger firms to incorporate more specific information and be associated with greater earnings informativeness. On the other hand, stock returns of larger firms may be more synchronous, implying that they incorporate less firm specific information, which suggests that firm size would be negatively associated with earnings informativeness.

Age

As already mentioned under section 4.4.1, Age is computed as the difference between every current firm-year and the Base date of the firm in Datastream (Guest 2009, Galema et al. 2008, Kohl and Schaefers 2012). The base date is the date on which a firm is first listed in Datastream. For most firms, this is the date when the firm became public. This measure is quite similar to other standard proxies of firm age used in the literature including; the number of years since a firm's incorporation (Oswald and Zarowin 2007), and number of years since a firm's initial public offering (Dasgupta et al. 2010). It is therefore highly unlikely that a younger publicly listed firm will have an earlier base date in Datastream than an older one.

Leverage

Similar to the analysis contained in the first empirical chapter, Leverage is measured as the ratio of total debt to total assets (Fama and French 2002, Leary and Roberts 2005). Total debt is computed as the sum of short term debt and long term debt. From an agency theory and governance perspective, Rajan and Zingales (1995) argue that total debt is a more suitable measure of debt as it is not affected by non-financing components. The theoretical relation between leverage and earnings informativeness are somewhat similar to the relationship between leverage and stock return synchronicity. As leverage moves more value of the firm to debtholders, stock returns may become relatively less responsive to corporate information and as such leverage would have a negative impact on earnings informativeness. On the other hand however, firms with higher leverage can be less synchronous since the risk transferred from equity holders to debt holders are of an idiosyncratic nature (Hutton et al. 2009).

Trading Frequency

Trading frequency is an indicator variable that takes the value of 1 if the firm is in the HTF category (earnings announcements for which the corresponding firm had a percentage of non-zero return days of >= 75% in the previous year of trading) and 0 if in the MTF (earnings announcements for which the corresponding firm had a percentage of non-zero return days of greater than 50% but less than 75% in the previous year of trading). As earlier stated in section 4.3.2 of the chapter, the sample of earnings announcements is divided into two based on the percentage of non-zero return days in the previous year of trading. The various measures of earnings informativeness are then presented for each of this subsamples consistent with Bartholdy et al. (2007). However,

in order to test the impact of trading frequency in the cross-sectional analyses, this indicator variable is included to capture the two sub-samples.

Synchronicity

Synchronicity is measured as the R^2 from a market model regression of the returns on each stock on the returns of its corresponding market index. Synchronicity is included in this analysis to control for the impact low or high synchronicity may have on earnings informativeness. Based on the extant literature, this relationship may be ambiguous especially for less developed markets like those in Africa. On the one hand, synchronicity may have a negative relationship with earnings informativeness since higher synchronicity could imply that stock returns incorporate less firm-specific information such as earnings (Morck et al. 2000, Wurgler 2000, Durnev et al. 2004). On the other hand, synchronicity may have no impact on earnings informativeness because it may be found to be averagely low in developing markets which are characterised by weaker information environments (Dasgupta et al. 2010). Since synchronicity is being used as an independent variable in this analysis, the non-transformed version is used.

Reporting Lag

Reporting Lag is the number of days between the fiscal year end of the firm and the earnings announcement date (Velury and Jenkins 2006, DeFond et al. 2007, Landsman et al. 2012, Pevzner et al. 2015). It is considered as an important indication of the timeliness of the earnings report (Chambers and Penman 1984). Givoly and Palmon (1982) argue that increased delay in announcing financial results causes greater uncertainty and could also lead to sub-optimal decision making by investors. Therefore, the reporting lag usually has an impact on the information content embedded in firm in earnings announcements with most of the studies cited above finding this impact to be negative.

4.4.3 Earnings informativeness: The role of institutional development

The objective of this chapter is to test for the impact of two measures of institutional development— the mandatory adoption of IFRS and the perception of corruption on earnings informativeness.

4.4.3.1 Dependent variables

The dependent variables used for this empirical analysis are Cumulative Abnormal Returns (CAR) and Abnormal Trading Volume (ATV). These are defined and constructed in conformity with Section 4.4.2 of this chapter.

4.4.3.2 Independent Variables

IFRS

IFRS is an indicator variable which takes the value of 1 in the post IFRS adoption year and 0 otherwise (Landsman et al. 2012, Chua et al. 2012). As the purpose of the analysis in this chapter is to investigate whether earnings have become more informative following the mandatory adoption, the post IFRS adoption year is the year immediately following the year of mandatory IFRS adoption? Given that the sample period for this study begins in 2005, the analysis contained in this chapter is limited to only countries that mandated the adoption of IFRS after 2005.

Corruption

Corruption is the transparency international corruption index in year t for each country. The transparency international corruption index is a composite index constructed from corruption related surveys that are conducted by a number of independent institutions including; The African Development Bank; The World Bank Group and the world economic forum (Transparency International 2010). These surveys are based on the views of experts and members of the business community. Before 2012, the corruption scores ranged from 0 to 10. The new scale from 2012 ranges from 0 to100. As the sample period for this study covers the 2005-2015 period, the 2012-2015 scores have been rescaled to make them consistent with the scale used in the pre-2012 period. In both periods, a higher score implies less corruption. To make interpretation of the results much easier, the inverse value of each score is used where 1 is divided by the score. Thus, a higher score would imply a higher level of corruption. Although the Transparency Corruption Index is quite a subjective view of experts, they capture many important conceptual, and socio-economic constructs and are correlated with other national polls conducted by citizens of the respective countries (Lee and Ng 2009). It is thus a widely accepted measure of corruption and has been used in many previous studies (eg. Mauro 1995, Ades and Di Tella 1999, Fisman and Miguel 2007, DeBacker et al. 2015).

Auditing and Reporting Standards

This is measured as a country's yearly score in the Global Competitiveness Index compiled under the sub-heading "Strength of Auditing and Reporting Standards" (Krishansing Boolaky 2011, Boolaky and Cooper 2015). The Global Competitiveness Index is compiled by the World Economic Forum (WEF) and is based on the Executive Opinion Survey which seeks the views of business leaders on a wide range of subjects on which data is always hard to find (World Economic Forum 2010). Under this sub-section of the survey, business leaders are asked to rate how strong financial, reporting and auditing standards are in their respective countries. The scores range from 1 to 7 with a higher score indicating stronger reporting and auditing standards. Griffin et al. (2011), who also use the same data, argue that income statements are considered to be more trustworthy when the quality of financial reporting is greater, which leads to stronger valuation signals.

Other independent variables

The other independent variables used for this empirical chapter are *Earnings, Earnings Growth, and Negative to Positive, Positive to Negative, Firm Size, Age, Leverage, Trading Frequency, Synchronicity and Reporting Lag*. These variables are as defined and constructed under section 4.4.2.2.

Table 4.4 presents definitions of all the variable used in this thesis. The distribution of each variable are also presented in the chapter appendix (see Appendix 4.1). Overall, the distribution of the variables do not pose any difficulty for the empirical analyses.

Table 4.4: Variable definitions

Variable	Definition	Data source	Supporting literature
Synchronicity	Measured as the R^2 from a market model regression of daily stock returns for stocks in each year against the market returns for the corresponding year.	Stock returns and Index returns from Data Stream	Morck et al (2000), Chan and Hameed (2006)
CAR	Cumulative Abnormal Return computed from the Market Adjusted Model. It is the sum of abnormal returns realized by a firm during the event window.	Event dates from Datastream	Brown and Warner (1985) Jones et al (2004)
ATV	Abnormal Trading Volume. This is computed as the average trading volume of a stock during the event window divided by average trading volume during a period prior to the event window. Trading volume is scaled my shares outstanding	Trading volume and number of shares outstanding from Datastream	Defond et al. (2007) Landsman et al. (2012) Pevzner et al. 2015
Earnings	Earnings of the company scaled by total assets.	Earnings reported from Datastream	Beaver (1968), Neurhierl et al. (2012)
Earnings Growth	Change in Earnings which is computed as the earnings in current year minus earnings in a previous year.	Earnings reported from Datastream	Landsman et al. (2012)
Positive to Negative	An indicator variable that equals 1 if the change in Earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise.	Earnings reported from Datastream	Bartov et al (2002), Kasznik and McNichols (2002)
Negative to Positive	An indicator variable that equals 1 if the change in Earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise.	Earnings reported from Datastream	Bartov et al. (2002), Kasznik and McNichols (2002)
Firm Size	The natural logarithm of the firm's market value at the beginning of the year.	Datastream	Chan and Hameed (2006), Boubaker et al. (2014), Pevzner et al. (2015)
Leverage	Total debt divided by total assets at the beginning of the year.	Datastream	Fama and French (2002), Leary and Roberts (2005)

Continued on next page

Table 4.4 continued

Trading Frequency	An indicator variable that takes the value of 1 if the firm experienced price changes in its stock at least 75% of trading days in the previous year and 0 if it experienced price changes in its stock at of 50% but less than 75% of trading days in the previous year.	Stock returns from datastream	Batholdy et al. (2007)
Age	The log of the number of years since the base date of the firm in DataStream	Datastream	Guest (2009), Galema et al (2008), Khol and Schaefers (2012)
Profitability	Operating profit scaled by Total Assets	Datastream	Liu et al. (2016)
Trading Volume	Volume of shares traded in each year scaled by shares outsanding at the end of the year.	Datastream	Devos (2015), Feng (2016)
Reporting Lag	The number of days between the fiscal year end of the firm and the earnings announcement date.	Datastream	Velry and Jenkins (2006), Landsman (2012), Pevzner et al. (2015)
Ownership structure variables			
Top 5 Shareholders	Percentage of shares directly held by the top 5 shareholders in each company. A measure of ownership concentration	Osiris	Prowse (1992), Hovey et al. (2003)
Government Ownership	Percentage of shares directly held by government or government agencies	Osiris	Gul et al. (2011)
Institutional Ownership	Percentage of shares directly held by institutional investors	Osiris	An and Zhang (2013
Families and Individuals	Percentage of shares directly held by families and individuals	Osiris	Villalonga and Amit (2006)
Country-level Variables			
Corruption	The inverse value of a country's yearly transparency international index score	Transparency International	Mauro (1995), Ades and Di Tella (1999), Fisman and Miguel (2007), DeBacker et al. (2015)
Auditing and Reporting Standards	A country's score in the Global competitiveness report sub=section "Strength of Auditing and reporting standards"	Global Competitiveness Report	Krishansing and Boolaky (2011), Boolaky and Cooper (2015), Griffin et al. (2011)

4.5 Overview of methodology

This section gives a general overview of the main methods used in the analyses contained in the thesis. Details of the various econometric models and specifications are, however, presented in the relevant empirical chapters. As already mentioned in section 4.4.1 of the chapter, an event study methodology is used for the purpose of computing abnormal returns for analyses on earnings informativeness. The Market Adjusted Model is used to compute abnormal returns by subtracting the return on the market index (expected return) from the return on the stock (actual return) on any given day within the event window.

In cross sectional and regression analyses across all three empirical chapters, the main estimation method used is the Ordinary least squares (OLS) regression. The use of the OLS regression technique is consistent with both the literature on synchronicity (eg. Gul et al. 2010, Hasan et al. 2014, Devos et al. 2015, Feng et al. 2016) and the literature on earnings informativeness (eg. DeFond et al. 2007, Landsman et al. 2012, Pevzner et al. 2015). In Chapter 5, the dependent variable is stock return synchronicity (Synch) whilst in chapters 6 and 7 the dependent variables are Cumulative Abnormal Returns (CAR) and Abnormal Trading Volume (ATV). The OLS estimator tests the linear relationship between a dependent variable and independent variables by estimating the parameters in a manner that minimizes the sum of the squared errors (Cameron and Trivedi 2010). Specification of the various models used in the empirical analysis are presented in the respective chapters. Bivariate correlations in each empirical chapters show that there is no high correlation among independent variables. This was further confirmed by variance inflation factor of less than 10 for each independent variable as part of regression diagnostics during the analyses. Also, all regressions are corrected for heteroskedasticity using robust standard errors consistent with the previous studies identified above. To control for any unobserved heterogeneity at the industry-level, industry dummies are included in all regressions in line with most of the previous studies already identified above. Hou and Robinson (2006) argue that firms in more concentrated industries experience lower returns because of high risks, arising out of their inability to engage in more innovation. Thus, one is likely to expect differences in synchronicity and market reactions to earnings between firms in different industries. Finally, to also, capture the impact of different time periods year dummies are included. This is especially

necessary as the sample period encapsulates the period of the recent Global Financial Crisis.

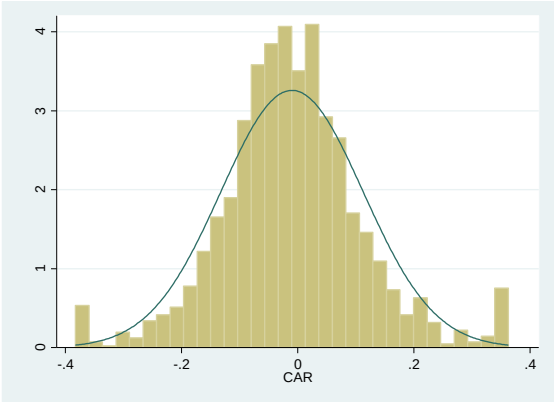
In Chapter 5, which focuses on stock return synchronicity, Fama-MacBeth regressions are also used to test the robustness of the results from the OLS regressions. This is because one concern with using the pooled OLS regression in that type of analysis is the problem of cross-sectional dependence. Problems of cross-sectional dependence are quite pervasive in finance and market-based accounting studies, especially in studies that relate stock returns or variables obtained from stock returns to accounting variables (Bernard 1987). According to Baltagi and Hashem Pesaran (2007), cross-sectional dependence emanates from spatial effects, spillover effects or unobservable common factors. A pooled OLS regression typically ignores issues of cross-sectional dependence by assuming that errors are uncorrelated across observations. Hence, the presence of this phenomenon in a pooled OLS regression could result in biased standard errors and lead to incorrect inferences (Collins and Dent 1984). A widely used approach to addressing the problem of cross-sectional dependence is the application of the Fama and MacBeth (1973) two-step regression procedure. In the first step of this process, cross-sectional regressions are carried out for each year. The second step computes a time series average of the coefficients from the first step. In this analysis, and similar to OLS regressions, industry effects are included. Statistical significance is calculated using T-statistics which are adjusted for heteroskedasticity and are computed based on Newey and West (1987) auto-autocorrelation consistent standard errors. Auto-correlation correction follows a first order auto-regressive process (Jin and Myers 2006, Haggard et al. 2008).

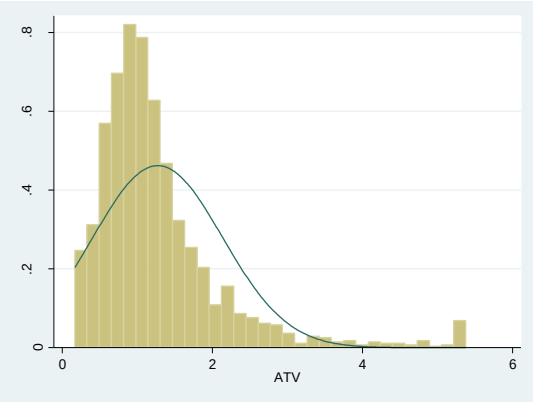
4.6 Summary

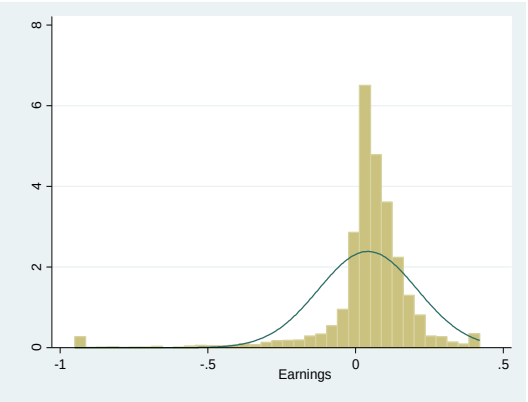
This chapter has presented the sources of data, and how the final sample of firms was determined. With the exception of South Africa, data from the other five countries are relatively smaller in terms of the number of listed companies. This provides a further premise to carry out the analysis on a country by country basis. The chapter has also provided details of how each variable was constructed most of which has been done with intuition from the extant literature. An overview of the methodology used in the study has also been provided with more details to be provided in the respective empirical chapters. The next chapter presents the first empirical analysis which focuses on synchronicity.

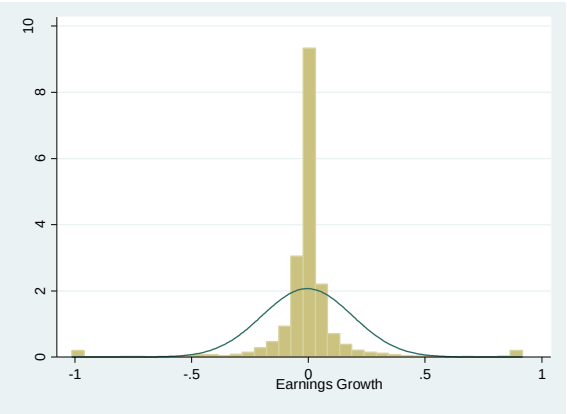
Chapter Appendices

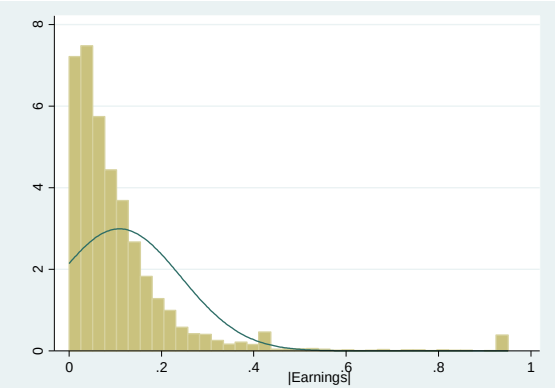
Appendix 4.1: Variable distributions

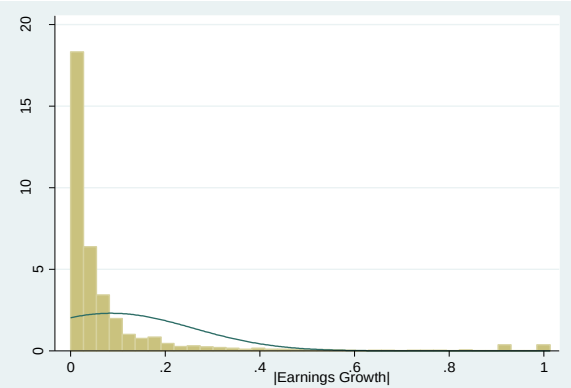


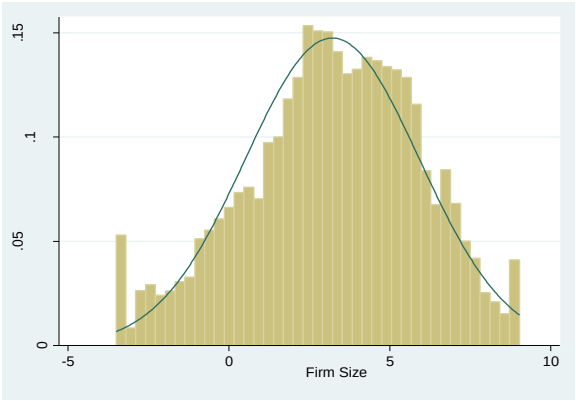








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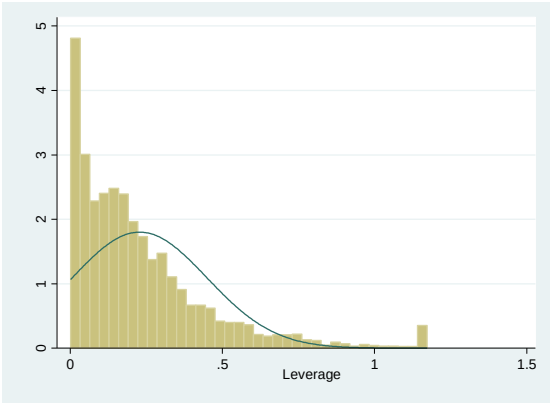
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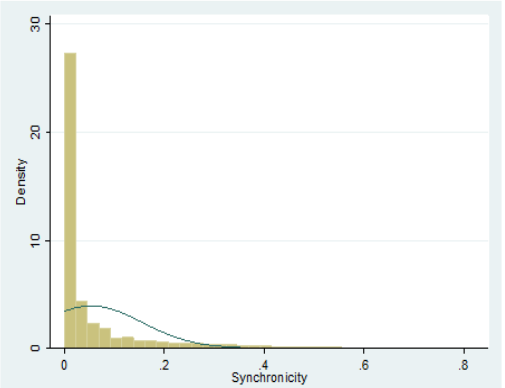
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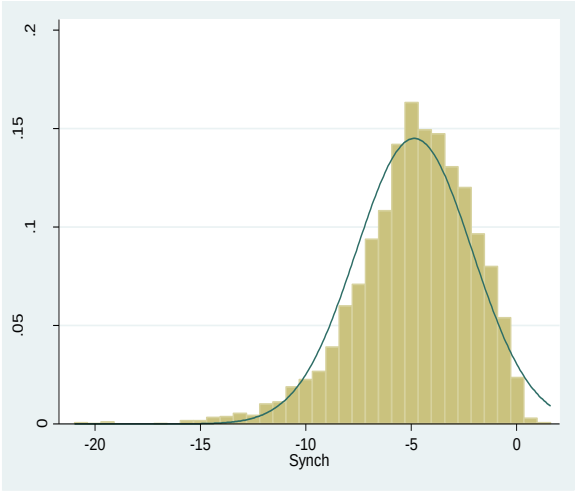
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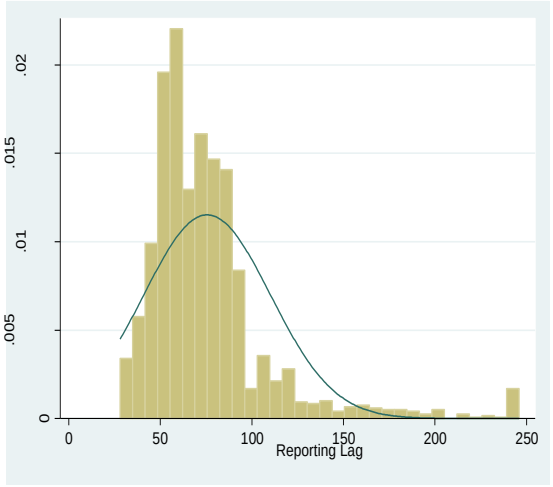
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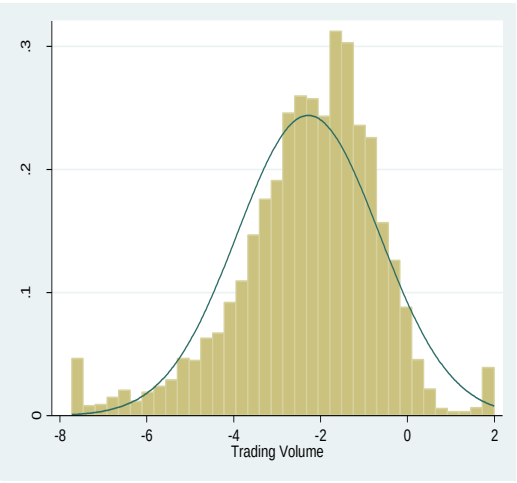
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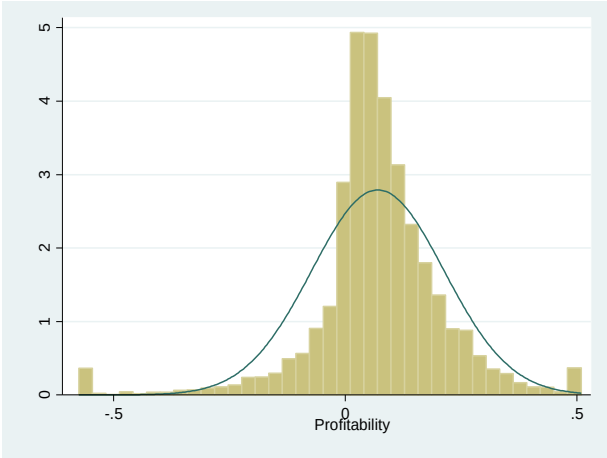
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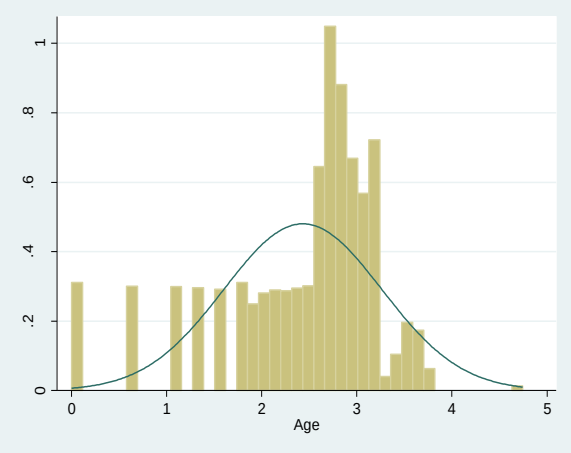
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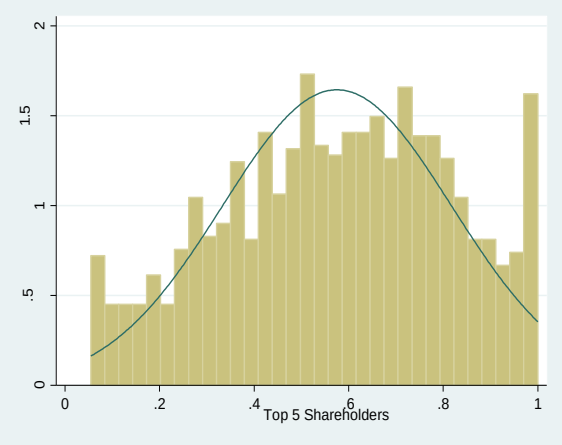
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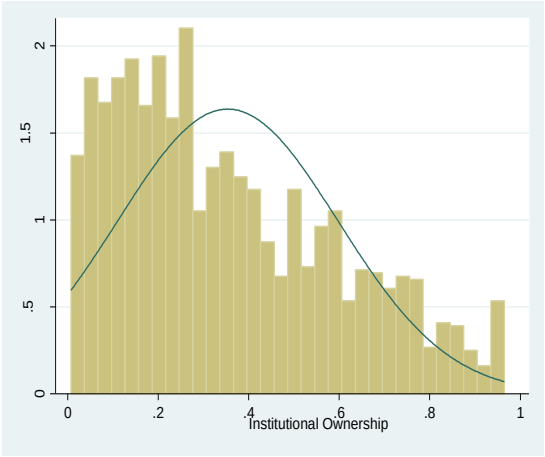
Top 5 Shareholders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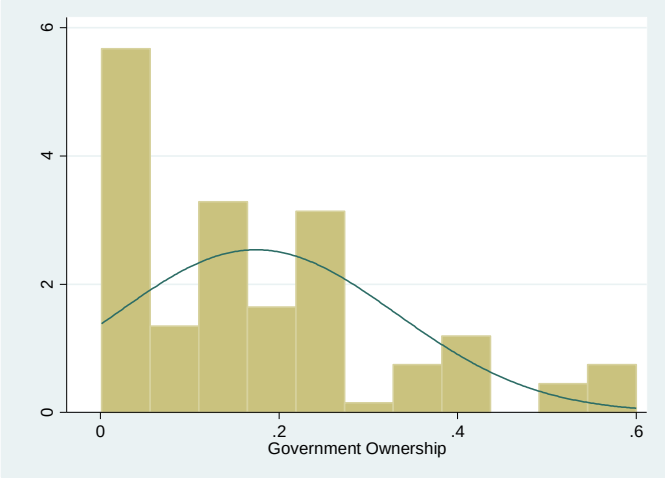
Institutional Ownership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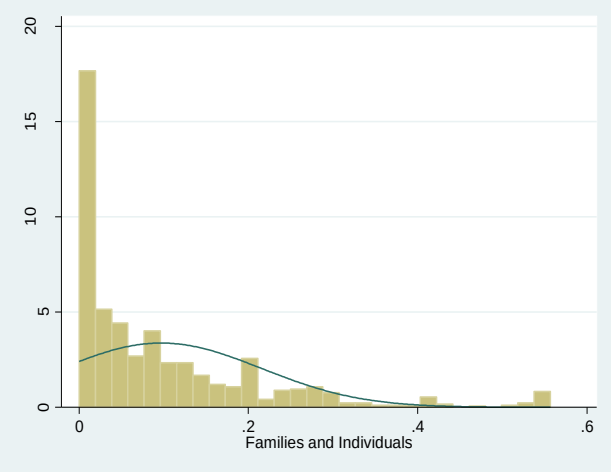
Government Ownership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Families and Individuals

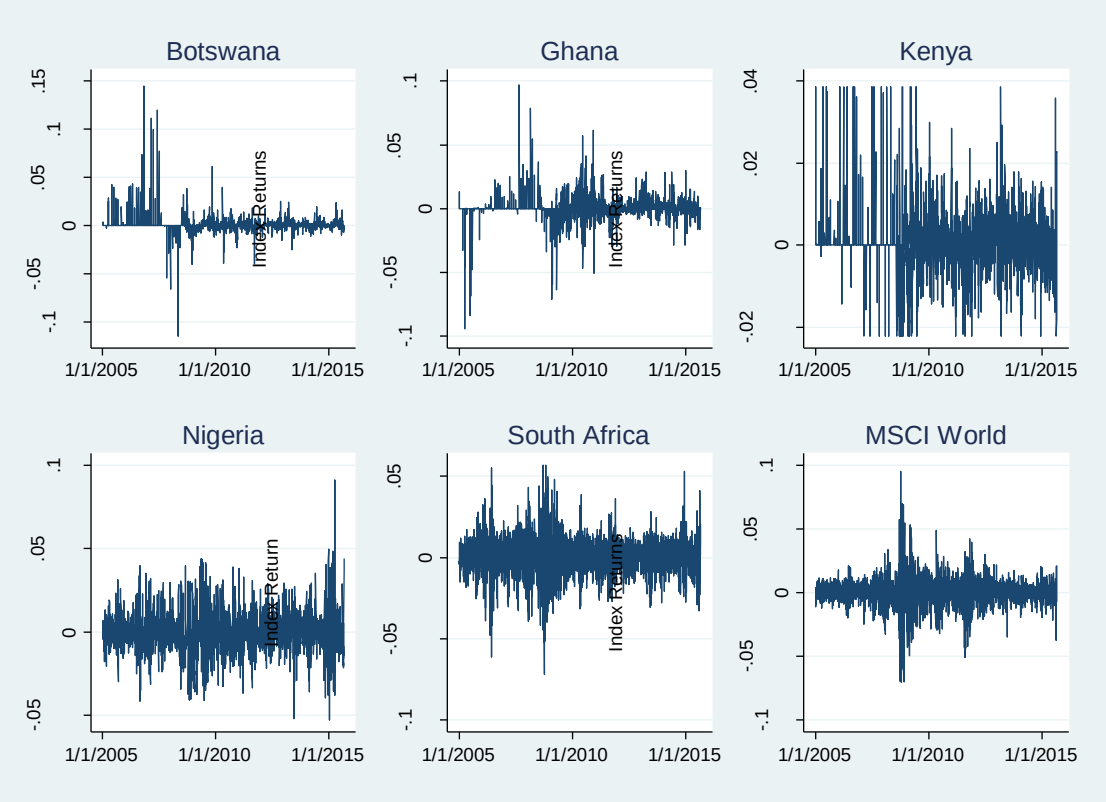
Appendix 4. 2: Unit root tests

This table presents results for tests of unit root. Panel A presents unit root tests for the stock indexes. The tests are carried out using the Augmented Dickey-Fuller (ADF) tests at levels with a lag length of 3. The lag length of 3 is chosen based on pre-estimations of AIC to determine the appropriate lag length. Panel B presents unit root tests for stock returns. Given that stock returns are organized as a panel data set, the Fisher type unit root tests with ADF regressions are used.

Panel A: Unit root tests of stock indices			
	Co-efficient	t-stat	p-value
Botswana	-0.906	-9.18***	(0.000)
Ghana	-0.7834	-7.66***	(0.000)
Kenya	-1.101	-11.72***	(0.000)
Nigeria	-0.7444	-14.48***	(0.000)
South Africa	-1.146	-15.45***	(0.000)
MSCI	-0.98137	-13.24***	(0.000)

Panel B: Unit root tests of stock returns					
	Botswana	Ghana	Kenya	Nigeria	South Africa
Inverse chi-squared	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inverse normal	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inverse logit	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Modified inv. chi-squared	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Appendix 4.3: Time series of index returns



Appendix 4.4

Raw, index and abnormal returns across event window (by year)

	Kenya			Nigeria			South Africa		
Year	Returns	Index Returns	Abnormal Returns	Returns	Index Returns	Abnormal Returns	Returns	Index Returns	Abnormal Returns
2005	25.000%	3.816%	21.184%**	-4.000%	0.403%	-12.473%	4.675%	0.248%	4.675%***
2006	-4.500%	0.431%	-4.931%**	-4.200%	0.001%	-4.228%	3.442%	0.071%	3.442%***
2007	-9.250%	-5.840%	-3.410%	1.933%	0.220%	-2.682%	-1.892%	0.468%	-1.892%*
2008	-0.208%	1.563%	-1.771%	-0.643%	-0.064%	0.710%	-3.517%	0.089%	-3.517%***
2009	-0.310%	-3.536%	3.226%	9.667%	0.191%	4.377%	2.709%	0.766%	2.709%**
2010	5.862%	3.921%	1.941%	2.000%	0.115%	-0.416%	1.992%	0.714%	1.992%*
2011	-1.871%	-0.552%	-1.318%	-5.556%	0.006%	-5.691%***	1.625%	-0.073%	1.625%
2012	2.848%	5.861%	-3.013%	3.107%	0.260%	-2.362%	1.634%	0.084%	1.634%
2013	7.864%	4.925%	2.938%	2.586%	0.082%	0.873%	1.176%	0.166%	1.176%
2014	2.214%	2.971%	-0.757%	-2.188%	0.013%	-2.466%	-0.464%	0.050%	-0.464%
2015	-7.235%	2.444%	-9.679%***	8.286%	0.564%	-3.566%	-3.414%	0.359%	-3.414%*

APPENDIX 4.5: Average returns over event window

AVERAGE RAW RETURNS						
	HTF			MTF		
	KY	NG	SA	KY	NG	SA
	Return	Return	Return	Return	Return	Return
-10	0.737%	-0.500%	0.203%	0.027%	0.060%	0.003%
-9	-0.211%	-1.389%**	0.444%	0.113%	-0.005%	0.057%
-8	0.263%	-0.083%	-0.113%	0.045%	0.115%	0.164%
-7	-1.000%*	0.472%	-0.737%	0.077%	0.203%	0.291%
-6	-0.947%*	-0.500%	0.015%	-0.207%	-0.027%	0.046%
-5	0.526%	-0.389%	-0.865%**	0.054%	-0.165%	0.128%
-4	-0.263%	-0.028%	0.105%	0.126%	-0.429%*	-0.016%
-3	-0.789%	-0.361%	0.068%	0.149%	-0.011%	0.094%
-2	-0.368%	0.000%	-0.421%	0.180%	0.209%	0.182%**
-1	-0.105%	0.389%	0.180%	0.297%	0.588%***	-0.009%
0	-0.526%	0.833%	0.023%	-0.577%**	0.110%	0.168%
1	-1.000%	-0.444%	0.421%	0.027%	0.143%	0.091%
2	-0.105%	0.083%	-0.293%	0.212%	0.247%	0.046%
3	-0.211%	0.083%	-0.729%**	-0.041%	0.440%*	0.023%
4	-1.526%**	0.139%	0.038%	0.054%	-0.176%	-0.066%
5	0.632%	0.500%	0.639%	0.333%	-0.170%	-0.143%
6	0.158%	-0.611%	-0.090%	-0.068%	0.033%	-0.026%
7	0.368%	0.472%	0.737%	0.153%	0.154%	0.032%
8	0.158%	-0.306%	0.068%	0.194%	0.093%	-0.071%
9	-0.105%	0.000%	-0.361%	-0.041%	-0.308%	-0.113%
10	-0.158%	-0.167%	0.526%	0.171%	0.242%	0.050%

Appendix 4.6: Market model alphas and betas

Panel A:Summary statistics of alphas and betas			Panel B: Distribution of Betas	
	alpha	**beta**	**Interval**	**Percent**
Kenya				
Mean	0.0008	0.3869	<0	15%
Standard Deviation	0.0035	0.7044	0—0.009	3%
Kurtosis	46.1601	120.6965	0.01—0.09	10%
Skewness	5.8297	9.0997	0.1—0.5	44%
Minimum	-0.0059	-1.0771	0.6—1.0	20%
Maximum	0.0361	10.3564	>1.0	7%
Nigeria				
Mean	0.0005	0.3625	<0	15%
Standard Deviation	0.0029	0.4068	0—0.009	10%
Kurtosis	75.1718	0.3834	0.01—0.09	11%
Skewness	6.4980	0.8073	0.1—0.5	35%
Minimum	-0.0066	-0.8907	0.6—1.0	22%
Maximum	0.0358	1.8106	>1.0	8%
TOTAL				**100%**
South Africa				
Mean	0.0025	0.2801	<0	18%
Standard Deviation	0.0290	2.6675	0—0.009	2%
Kurtosis	1199.6617	950.3710	0.01—0.09	10%
Skewness	31.9142	7.1013	0.1—0.5	50%
Minimum	-0.0210	-81.4141	0.6—1.0	15%
Maximum	1.2066	94.2829	>1.0	5%
TOTAL				**100%**

Chapter 5

Stock Return Synchronicity in African Markets

5.1 Introduction

The aim of this chapter is to examine the general level of stock return synchronicity in African markets. It is motivated by the arguments in prior literature that emerging markets tend to exhibit higher levels of stock return synchronicity than their developed counterparts (eg. Morck et al. 2000). Despite this widely held view, there has been the lack of a comprehensive analysis as to whether African markets are synchronous or not. Some of the reasons which studies attribute to why developing countries may exhibit higher levels of synchronicity than developed countries include the fact that poor protection of property rights discourages trading, which then leads to slower incorporation of firm-specific information into stock prices (Morck et al. 2000). Another reason may lie in the nature of corporate ownership. For example, Gul et al. (2010) find that firms with generally higher levels of ownership concentration tend to have a lower level of firm-specific information incorporated into their stock prices.

Although African countries might generally be seen as having weak protection of property rights, it remains to be seen as to whether this could account for the levels of synchronicity. There is a school of thought which proposes that more developed countries with better transparency and protection of property rights might be associated with higher levels of synchronicity whilst countries with poorer transparency and weaker protection of property rights may exhibit lower levels of synchronicity (Dasgupta et al. 2010, Kelly 2014). This is because, in more developed markets, information may be rapidly and frequently incorporated into stock prices ahead of being announced and when such information is finally announced, there is little new information content. As such returns of such stocks might exhibit higher levels of R^2.

Taken the above together, this chapter seeks to answer three main questions. First, what is the level of stock return synchronicity in African markets? What firm characteristics are important in explaining stock return synchronicity? Finally, is stock return stock return synchronicity affected by ownership structure? The findings in this chapter reveal an averagely low level of R^2 implying lower synchronicity. This is consistent with the alternative view expressed by Dasgupta et al. (2010). Synchronicity also appears to have remained persistently low over the sample period. Thus contrary to conventional wisdom, firms in African markets on average do not exhibit high levels of

synchronicity. This provides support for the arguments that synchronicity can be relatively low in a poor information environment. Further, regression results show that the main driver of synchronicity within firms and across all five countries is firm size. Larger firms are associated with higher levels of synchronicity, consistent with the argument that large firms act as leading market indicators by signaling macroeconomic trends which have the potential to trigger similar aggregate markets movements to smaller firms in a market (Piotroski and Roulstone 2004). Finally, no evidence is found to support the view that synchronicity is influenced by ownership structure.

Overall, the findings in this chapter contribute to the literature on stock return synchronicity by providing evidence in support of the theoretical arguments by Dasgupta et al. (2010) that developing markets, usually characterised by weak information efficiency, may not always fit the stereotypical view that they are synchronous. Across different measures of stock return synchronicity, the evidence in this chapter shows that the average level of synchronicity of firms in each of the five countries is less than 10%. This implies that market movements account for less than 10% for the movement in stock returns on average. The highest level of synchronicity of 8% is observed in the Nigerian sample. South Africa has the second highest of 7%, with Ghana having the lowest of 4%. Botswana and Kenya have 6% and 5% respectively. In a poor information environment, market valuations may be highly inaccurate, the cost of capital will rise to reflect increased risk and valuable investment will be discouraged. Nonetheless, this chapter argues that in a low synchronicity environment, stock market reactions to corporate events, which carry new information about the firm value, will be the primary source of price efficiency.

The rest of the chapter is organised as follows: Section 5.2 develops the hypothesis to be tested. Section 5.3 presents the empirical design. The results are presented in Section 5.4 including summary statistics, univariate tests and cross-sectional models of synchronicity. Robustness checks are conducted in Section 5.5. Section 5.6 concludes the chapter.

5.2 Hypothesis development

This section formulates the hypothesis to be tested in this chapter.

Are African markets synchronous?

Since Roll (1988), there have been a number of studies on synchronicity which use R^2 as the primary measure. For most studies that have examined this in a cross-country context, the consensus has generally been that more developed markets are associated with less synchronicity than less developed countries (Morck et al. 2000, Jin and Myers 2006). At the forefront of this strand of literature is Morck et al. (2000) who argue that weak protection of property and investor rights adversely affect how investors react to corporate information and thus leads to lower incorporation of firm-specific information into stock prices. Jin and Myers (2006) attribute higher synchronicity in less developed countries to opacity or lack of transparency i.e. a weak information environment. Generally poor corporate governance practices which encourage practices such as controlling shareholders (Boubaker et al. 2014) and director interlocks (Khanna and Thomas 2009), could bring about reduced firm-level transparency leading investors to rely on higher levels of stock return synchronicity. A relatively recent study, however, departs from these previous studies by arguing that stock return synchronicity can be low in less developed countries and high in more developed countries with higher transparency (Dasgupta et al. 2010). They argue that most often, stock prices react to news that has not been anticipated by the market. Therefore, in an improved information environment, the market is able to make predictions about future events due to the availability of information. Consequently, when these events occur, there is little surprise and thus lower firm-specific variation. Conversely, in a weak information environment, the inability to accurately value firms leads to greater information shocks from new information and can lead to higher firm-specific variation i.e. lower synchronicity. As noted in Chapter 2, despite the presence of some regulatory framework and codes of corporate governance, African markets are still challenged with problems of enforcement and lack of transparency. This implies the information environment is still relatively weak, which leads to the first hypothesis that;

H1. Stock returns of African firms on average exhibit low levels of stock return synchronicity.

Determinants of synchronicity: the impact of firm size and age

In examining the factors that may account for stock return synchronicity among firms, two issues deserve particular attention for their theoretical and intuitive significance—firm size and age. This is because these two variables have the potential to greatly affect the firm's information environment which would then have implications for stock return synchronicity. For example, Atiase (1985) argues that the amount of information production and dissemination is a function of firm size. Based on his "differential information" hypothesis, he argues that the amount of unexpected information conveyed to the market by corporate information such as earning reports is related to the market capitalisation of firms. Based on this premise, size may have implications on stock return synchronicity as stock return synchronicity is equally a function of a firm's information environment. The impact of firm size on stock return synchronicity, however, impact may be quite ambiguous. On the one hand, larger firms may be associated with more shareholders and investors who could trade more often to incorporate firm information into stock prices (Roll 1981). Thus larger firms may be associated with lower synchronicity. On the other hand, Roll (1988) observes a positive relationship between firm size and R^2 arguing that larger firms may be less susceptible to systematic risks that do not arise from the market as a whole. On this note, one may expect a significant and positive relationship between firm size and synchronicity. Further as can be observed from Chapter 2, most African markets are relatively small in size which also implies that most firms are also small. Therefore larger firms in African markets are more likely to act as leading market indicators by signalling market movements which means that their returns are more likely to be synchronous.

The age of a firm also plays an important role in its information envirnoment as older firms have less information uncertainty due to greater historical performance records available to the market (Lu et al. 2010). This longer trading history and reduced uncertainity also makes it easier for the market to predit the asset value of such firms. Further, Dasgupta et al. (2010) posit that the market learns more about the intrinsic qualities of a firm as it grows older. Hence, based on their framework, it should be easier for market participants to accurately predict future events about older firms leading to less surprise when these events eventually occur. Hence, older firms will be associated with higher stock return synchronicity. As shown in Chapter 2, most stock markets in the sample are relatively young, with the exception of South Africa. This can largely be said for most other stock markets across the continent. For example the stock markets of Ghana and Botswana are currently less than 30 years old. Thus, firms in African countries would equally be

young as firm firm age mostly measures the period of time from which a stock was publicly listed. Based this and the preceding discussion on how firm age affects a firm's information environment, one would expect returns of firms to be less synchronous as the market knows little about such firms and would therefore act with greater surprise when corporate information is released. However, as these firms grow older and information uncertainity about them reduces, there should be lower surprise about information and consequently resulting in higher stock return synchronicity.

H2: Larger firms in African markets exhibit higher levels of synchronicity.

H3: Older firms in African markets exhibit higher levels of synchronicity.

Ownership structure and synchronicity

Concentrated ownership

When ownership concentration is high, the perception that the majority of shareholders will have the tendency to hold up incentives to expropriate minority shareholders heightens (Haniffa and Hudaib 2006). Corporate information is therefore likely not to have any informative value. Fan and Wong (2002) make this argument using earnings announcements. Based on the entrenchment effect argument of ownership concentration, elaborated upon by Morck et al. (2005) and Fan and Wong (2002), in the presence of controlling shareholders, the credibility of corporate information in general, and accounting information in particular, is reduced because outside investors assume that such information is usually reported out of the self-interest of the controlling owner, who can manipulate earnings numbers for expropriation purposes. Similarly, Fan and Wong (2002) advance another argument, the information argument, which claims that the need to keep proprietary information within a company in order to maintain a competitive advantage may result in higher concentration of ownership. Consequently, this might lead to tight information flows and a decrease corporate transparency. Gul et al. (2010) find a statistically significant association between ownership concentration, measured as the percentage of shares held by the largest shareholder, and stock return synchronicity. They, however, find this relationship to be concave. Boubaker et al. (2014) find a positive relationship between ownership by large controlling shareholders and stock return synchronicity whilst Brockman and Yan (2009) make a similar conclusion involving block holders. As observed in Chapter 2 of this thesis, ownership concentration is relatively high in both the sample markets and other markets on the continent. And thus it can be expected that this would have an impact on stock return synchronicity.

H4: Firms with higher levels of ownership concentration in African markets are associated with greater stock return synchronicity.

Government Ownership

Shleifer (1998) posits that governments take advantage of their control of state firms to transfer wealth to people who are sympathetic to them. This obviously makes such firms inefficient. Consistent with this view, Gul et al. (2010) argue that government ownership of firms is likely to result in weak corporate governance and poor protection of minority shareholders. This means that the entrenchment effect of corporate ownership is greater when government ownership is higher. They find that prices of stocks which have government as the largest shareholder are less informationally efficient since these stocks exhibit greater synchronicity. Similarly, Ben-Nasr and Cosset (2014) find that state ownership is linked with lower informativeness of stock prices because state ownership tends to be characterized by less transparency which demotivates investors from trading in order to facilitate the incorporation of information into stock prices. The establishment of most African stock markets has, over time, led to a reduction in the role of government as most governments divest their shares in state owned entities that get listed. However, like many other developing countries, there is still the presence of some government ownership. For example, as noted in Chapter 2 of this thesis, some studies such as Tsamenyi et al. (2007) document government ownership of up to 22% in Ghana. This situation and the accompanying lack of transparency that tends to characterise government ownership of firms across the world might cause firms with high levels of government ownership to be associated with greater stock return synchronicity.

H5: Firms with higher government ownership are associated with greater stock return synchronicity.

Institutional Ownership

According to Piotroski and Roulstone (2004), informed market participants such as institutional investors also affect a firm's institutional environment. However, they argue that the relation between trades of institutional investors and how stock prices incorporate firm-specific information is ambiguous. This is because, whilst large trades are more likely to be driven by information, small trades could merely be for the purposes of rebalancing and other liquidity considerations. Boehmer and Kelley (2009), however, find that stocks with a greater level of institutional holdings follow a random walk implying that such prices are more informationally efficient. They base their findings on the premise that institutional

investors engage in significant trading which helps to eliminate mispricing in the market. Their results are consistent with the views of Bartov et al. (2000) that institutional holdings help to mitigate stock market anomalies. Shu (2013) draws a distinction between institutional trading and institutional ownership as two components of institutional investor participation. Whilst overall, institutional investor participation decreases stock market anomalies, the effect of institutional trading is stronger. Further, An and Zhang (2013) claim that institutional investors, by virtue of their relatively larger stakes, have a greater incentive to monitor. This helps to mitigate the extraction of private benefits by managers and ultimately leads to a reduction in firm-specific risk absorbed by managers. As such, stock prices of such firms tend to be less synchronous. As can be noted from Chapter 2, there is a good amount of institutional ownership of firms in markets in the sample. If these institutional investors, both local and foreign, play their monitoring role as expected, there is likely to be greater transparency and therefore stock returns of such firms should be associated with less synchronicity.

H6: *Firms with higher institutional ownership are associated with less synchronicity.*

Families and individuals

The information environment of firms and its consequent impact on stock return synchronicity is also affected by the nature of ownership of families and individuals. Chau and Gray (2002) argue that family-controlled firms have little incentive to voluntarily disclose information because the demand for disclosure by such companies is weak. They find evidence of this using a sample of firms in both Hong Kong and Singapore. Abdallah and Ismail (2017) also observe that one of the main governance issues around family-controlled firms is that of poor transparency and accountability. Equally, issues of family ownership are of relevance to African firms. One of the main reasons why owners of firms in African markets are reluctant to go public is the requirement that will be placed on them to be transparent in line with regulations of listed companies (Acquaah 2015). This implies that, for listed companies that are family controlled, there is still likely to be a residual inertia by owners and management to engage in full and proper disclosure. Taken these together, one may expect that stock returns of firms that have a huge amount of family and individual ownership will be highly synchronous.

H7: *Firms with higher family and individual ownership are associated with higher stock return synchronicity.*

5.3 Empirical design

As already discussed in Chapter 4, R^2 from a regression of a firm's return on a market index, proposed by Roll (1988) and further developed by Morck et al. (2000), is a widely used measure of the level of stock return synchronicity. Three versions of this estimation are used in this chapter. The first is based on Chan and Hameed (2006), where synchronicity is determined from the $R^2$of a market model regression as follows;

$$R_{it} = \alpha_i + \beta_i RM_t + \varepsilon_{it} \quad 5.1$$

where for each firm i, R is the return on day t and RM is the corresponding contemporaneous market return on day t.

The second estimation includes a lagged value of the market index RM to help address potential problems associated with non-synchronous trading (Boubaker et al. 2014, Brockman and Yan 2009, Feng et al. 2016, Chan and Chan 2014).

$$R_{it} = \alpha_i + \beta_i RM_t + \beta_2 RM_{t-1} + \varepsilon_{it} \quad 5.2$$

The third estimation includes the world market return in line with Hasan et al. (2014).

$$R_{it} = \alpha_i + \beta_i RM_t + \beta_2 RM_{t-1} + \beta_3 WorldReturn_t + \varepsilon_{it} \quad 5.3$$

Where World Return is the corresponding return on the MSCI World Index on day t. In the spirit of Morck et al. (2000), and in line with most previous studies on synchronicity, the R^2 is logistically transformed to enable it to range from negative infinity to positive infinity for the purpose of carrying out regressions. Using the transformed version as a dependent variable is problematic since it is bounded within the unit interval. Therefore, Synchronicity, denoted as either Synch1, Synch2 or Synch3 is computed as:

$$Synchronicity = log\left(\frac{R^2}{1-R^2}\right) \quad 5.4$$

Where R^2 is derived from estimating equations 5.1 ($Synch_1$), 5.2 ($Synch_2$) and 5.3 ($Synch_3$).

To ascertain the determinants of synchronicity, the following equation is estimated:

$$\begin{aligned} Synch_{it} = \ & \alpha_i + \beta_1 FirmSize_{it} + \beta_2 Age_{it} + \beta_3 Leverage_{it} + \beta_4 Profitability_{it} \\ & + \beta_5 Non\ zero\ return\ days_{it} + \beta_6 Firms\ in\ industry_{it} \\ & + \beta_7 Trading\ Volume_{it} \\ & + Industry + Year + \varepsilon_{it} \end{aligned} \quad 5.5$$

Where for each firm i, Synch is either $Synch_1$ $Synch_2$ or $Synch_3$ at time t, *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Log (Age)* is the log of the number of years since a firm's base date in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Profitability* is measured as Income scaled by total assets. *Non-zero return days* is the number of days a firm has non-zero returns in the previous year. *Log (Firms in Industry)* is the log of the number of firms in the industry to which a firm belongs. *Trading Volume* is the total trading volume of a firm in each year scaled by the number of shares outstanding at the year-end.

To test the influence of ownership structure, a set of ownership variables are introduced into equation 5.5 above:

$$\begin{aligned} Synch_{it} = \ & \alpha_i + \beta_1 Ownership_{it-1} + \beta_2 FirmSize_{it} + \beta_3 Age_{it} + \beta_4 Leverage_{it} \\ & + \beta_5 Profitability_{it} + \beta_6 Non\ zero\ return\ days_{it} \\ & + \beta_7 Firms\ in\ industry_{it} + \beta_8 Trading\ Volume_{it} + Country \\ & + Industry + Year + \varepsilon_{it} \end{aligned} \quad 5.6$$

Where for each firm i, Ownership includes Top 5 Shareholders, Institutional Ownership, Government Ownership, and Families and Individuals. Top 5 shareholders is the percentage of shares directly held by largest 5 shareholders. This serves as a proxy for ownership concentration. Institutional Ownership is the percentage of shares directly held by institutional investors. Government Ownership is the percentage of shares directly held by Government and Government Agencies whilst Families and Individuals is the

percentage of shares directly held by families and individual investors. All other variables are as defined in equation 5.5.

5.4 Empirical results

This section presents the results of the empirical analysis. It begins with summary statistics and correlations and then proceeds to both univariate and multivariate analysis of stock return synchronicity.

5.4.1 Summary statistics and correlations

Table 5.1 presents summary statistics of the data and variables used in this chapter. It reports on a country by country basis, firm-year observations (count), mean, standard deviation, minimum values, median and maximum values. Panel A reports those of Botswana, Panel B reports those of Ghana. Panels C, D and E report summary statistics of Kenya, Nigeria and South Africa respectively.

For all firm-year observations in all five countries, the mean synchronicity value for all three measures of synchronicity is below 10%, implying that firms in these countries, on average, exhibit low levels of synchronicity. This is consistent with Dasgupta et al (2010) who argue that synchronicity in less developed countries can be lower compared to more developed markets. This argument will be considered in more detail in subsequent sections of the chapter. Maximum values of synchronicity across five countries suggest that some firms may exhibit high synchronicity with market movements. In Botswana, the maximum value is around 70% for all three measures. In the case of Ghana, the maximum value is about 83% for all three measures whilst in Kenya, Nigeria and South Africa, the maximum values are 69%, 75%, and 74% respectively.

With respect to other variables, the mean (median) value for firm size is $185m ($80m) for Botswana, $129m ($43m) for Ghana, $238m ($70m) for Kenya, $537m ($73m) for Nigeria and $806m ($114m) for South Africa. Intuitively, countries in the sample which have larger stock markets on average have larger firms. Values of firm size are highly skewed. For this reason, the natural logs are used in regressions. The mean median Age is 3(3) for Botswana, 3(3) for Ghana, 15(17) for Kenya, 3(3) for Nigeria and 12(12). The mean (median) value of leverage is 14 % (8%) for Botswana, 21% (13%) for Ghana, 16 % (12%) for Kenya, 20% (15%) for Nigeria and 22%(17%) for South Africa. The figures

suggest that firms in these countries do not use high levels of debt in their capital structure. In terms of profitability, firms in Ghana are ranked lowest with mean profitability of 3%. Firms in Botswana exhibit the highest level of profitability with the mean figure of 10%. The mean profitability figure for Kenya, Nigeria, and South Africa are 6%, 5%, and 4% respectively. As expected, firms in more developed markets exhibit greater liquidity. The average non-zero return days is highest for firms in Kenya (53%), followed by South Africa (44%) and Nigeria 35%. Botswana has a mean value below 10% whilst Ghana on average has about 10%. Finally, and equally intuitively, firms in South Africa have larger trading volume, consistent with the idea that it is a more developed market. The mean trading volume figure is 0.4. The mean trading volume for Nigeria is 0.1 and that of Kenya 0.13. The mean trading volume figures for Botswana are 0.04 and 0.2 respectively. As would be expected, this shows that trading activity is higher in South African than in the rest of the countries. Not quite surprisingly, trading Activity is lowest in Botswana than in the other four countries. The picture presented by the data is one of differing levels of financial and institutional development. Importantly, markets considered here have distinguishing characteristics which will allow modelling to be conducted to assess the factors which determine the level of synchronicity. And some common factors are also present allowing some combination of markets when conducting hypothesis testing.

Table 5.2 presents bivariate correlations of variables used for each country. Panel A presents those of Botswana, Panel B presents those of Ghana whilst Panels C, D and E presents those of Kenya, Nigeria and South Africa respectively. Generally, the correlations in across all five countries depict low to moderate correlations. For example, in terms of correlations between independent variables, the highest correlation observed in Botswana is between Firm Size and Firms in industry (0.601). In Ghana the highest correlation figure between a pair of independent variables is between Leverage and Profitability (0.636). In Kenya, this is can be observed between Firm Size and Non-Zero return days (0.413). In the case of Nigeria the highest correlation among independent variables is between Non-zero returns days and trading volume (0.428), whilst in South Africa this can be noted for the correlation between Non-zero return days and Firm Size. Several of the correlations among independent variables are less than 0.2. The low to moderate level of correlations among variables implies that multicollinearity does not pose a challenge to the use of OLS estimations in the multivariate regression analysis.

Table 5.1: Summary statistics

This table presents summary statistics of variables used. It reports the number of observations, mean, standard deviation, minimum value, median value and maximum values. In order to minimise the effects of outliers, continuous variables are winsorised at the 1st and 99th percentile. For variables that are log transformed, the non-log transformed version is reported in this table.

Panel A: Botswana						
	Count	Mean	SD	Min	Median	Max
$Synch_1$	103	0.050	0.141	0.000	0.003	0.707
$Synch_2$	103	0.054	0.142	0.000	0.007	0.709
$Synch_3$	103	0.058	0.141	0.000	0.010	0.709
Firm Size($million)	88	184.973	223.556	0.920	79.620	861.070
Age	103	2.952	1.997	0.000	3.000	6.000
Leverage	73	0.141	0.131	0.002	0.082	0.449
Profitability	100	0.102	0.090	-0.120	0.086	0.415
Non- Zero return days	103	0.075	0.064	0.000	0.058	0.319
Firms in Industry	103	2.500	2.810	1.000	1.000	8.000
Trading Volume	100	0.042	0.054	0.000	0.020	0.329
Panel B: Ghana						
	Count	Mean	SD	Min	Median	Max
$Synch_1$	235	0.027	0.076	0.000	0.002	0.833
$Synch_2$	235	0.032	0.078	0.000	0.005	0.834
$Synch_3$	235	0.035	0.078	0.000	0.009	0.837
Firm Size ($million)	119	129.429	185.528	0.400	43.340	805.210
Age	161	3.087	1.992	0.000	3.000	7.000
Leverage	174	0.217	0.266	0.001	0.131	1.172
Profitability	206	0.033	0.153	-0.951	0.039	0.311
Non- Zero return days	235	0.099	0.101	0.000	0.062	0.506
Firms in Industry	235	3.375	3.114	1.000	2.000	10.000
Trading Volume	220	0.208	1.043	0.000	0.018	7.356
Panel C: Kenya						
	Count	Mean	SD	Min	Median	Max
$Synch_1$	473	0.042	0.085	0.000	0.007	0.665
$Synch_2$	473	0.050	0.088	0.000	0.015	0.689
$Synch_3$	473	0.054	0.088	0.000	0.020	0.693
Firm Size ($million)	455	237.849	482.496	0.380	70.480	5498.730
Age	473	15.275	6.652	0.000	17.000	24.000
Leverage	340	0.165	0.158	0.001	0.117	0.746
Profitability	402	0.056	0.086	-0.677	0.045	0.421
Non- Zero return days	473	0.531	0.215	0.000	0.595	0.835
Firms in Industry	473	5.444	2.001	1.000	2.000	17.000
Trading Volume	443	0.137	0.446	0.000	0.064	7.356

Continued on next page

Table 5.1 continued

Panel D: Nigeria						
	Count	Mean	SD	Min	Median	Max
$Synch_1$	793	0.063	0.104	0.000	0.016	0.750
$Synch_2$	793	0.073	0.107	0.000	0.027	0.756
$Synch_3$	793	0.077	0.107	0.000	0.032	0.756
Firm Size ($million)	453	537.496	1253.194	1.070	72.710	8364.220
Age	702	2.922	2.166	0.000	3.000	11.000
Leverage	501	0.198	0.179	0.001	0.151	0.972
Profitability	612	0.050	0.105	-0.830	0.042	0.421
Non- Zero return days	793	0.349	0.278	0.000	0.314	0.916
Firms in Industry	793	13.444	4.802	2.000	7.000	46.000
Trading Volume	637	0.109	0.121	0.000	0.072	1.388
Panel E: South Africa						
	Count	Mean	SD	Min	Median	Max
$Synch_1$	3124	0.057	0.104	0.000	0.011	0.610
$Synch_2$	3124	0.063	0.105	0.000	0.018	0.628
$Synch_3$	3124	0.069	0.107	0.000	0.024	0.749
Firm Size ($million)	2883	806.768	1726.011	0.040	114.150	8364.220
Age	3124	12.413	8.646	0.000	12.000	42.000
Leverage	2664	0.227	0.215	0.001	0.174	1.172
Profitability	3017	0.041	0.183	-0.951	0.062	0.421
Non- Zero return days	3124	0.437	0.232	0.000	0.487	0.905
Firms in Industry	3124	40.400	12.791	1.000	32.000	112.000
Trading Volume	2953	0.407	0.918	0.000	0.201	7.356

Table 5.2: Correlations

This table presents correlations of the variables used. Panels A, B, C, D, and E represent correlations for Botswana, Ghana, Kenya, Nigeria and South Africa respectively.

Panel A: Botswana

		1	2	3	4	5	6	7	8	9
1	$Synch_1$	1								
2	$Synch_2$	0.862***	1							
3	$Synch_3$	0.791***	0.912***	1						
4	Firm Size	0.448***	0.459***	0.446***	1					
5	Age	-0.0823	-0.0948	-0.0819	0.101	1				
6	Leverage	0.279**	0.280**	0.234**	0.119	-0.0120	1			
7	Profitability	-0.0642	-0.0488	-0.0227	0.0901	-0.0855	0.00812	1		
8	Non Zero return days	0.290***	0.286***	0.279***	0.392***	0.210**	0.0998	0.163	1	
9	Firms in Industry	0.305***	0.284***	0.237**	0.601***	0.0724	0.313***	0.0392	0.241**	1
10	Trading Volume	0.222**	0.158	0.117	0.0711	0.146	-0.0530	0.0399	0.304***	0.0235

Panel B: Ghana

		1	2	3	4	5	6	7	8	9
1	$Synch_1$	1								
2	$Synch_2$	0.830***	1							
3	$Synch_3$	0.756***	0.893***	1						
4	Firm Size	0.573***	0.624***	0.619***	1					
5	Age	-0.00694	0.117	0.0924	0.0253	1				
6	Leverage	-0.180**	-0.210***	-0.193**	-0.306***	0.0299	1			
7	Profitability	0.0696	0.107	0.0744	0.320***	-0.0289	-0.636***	1		
8	Non Zero return days	0.443***	0.490***	0.461***	0.564***	0.186**	-0.258***	0.176**	1	
9	Firms in Industry	0.212***	0.226***	0.165**	0.256***	0.00525	-0.120	-0.139**	0.188***	1
10	Trading Volume	0.245***	0.262***	0.206***	0.217**	-0.178**	-0.493***	0.321***	0.314***	0.227***

Continued on next page

Table 5.2 continued

Panel C: Kenya

		1	2	3	4	5	6	7	8	9
1	$Synch_1$	1								
2	$Synch_2$	0.838***	1							
3	$Synch_3$	0.782***	0.906***	1						
4	Firm Size	0.436***	0.445***	0.499***	1					
5	Age	-0.104**	-0.143***	-0.160***	-0.156***	1				
6	Leverage	-0.106*	-0.122**	-0.121**	-0.185***	-0.0445	1			
7	Profitability	0.104**	0.133***	0.141***	0.252***	-0.0498	-0.185***	1		
8	Non Zero return days	0.258***	0.263***	0.253***	0.413***	0.0458	0.0192	-0.0368	1	
9	Firms in Industry	0.0464	0.0482	0.0373	0.0192	-0.0932**	-0.268***	-0.0519	0.0507	1
10	Trading Volume	0.114**	0.173***	0.153***	0.0978**	-0.249***	0.132**	0.129**	0.260***	-0.0611

Panel D: Nigeria

		1	2	3	4	5	6	7	8	9
1	$Synch_1$	1								
2	$Synch_2$	0.881***	1							
3	$Synch_3$	0.837***	0.957***	1						
4	Firm Size	0.560***	0.577***	0.608***	1					
5	Age	-0.0154	-0.0404	-0.0550	0.0489	1				
6	Leverage	-0.233***	-0.243***	-0.238***	-0.201***	0.0404	1			
7	Profitability	0.0541	0.0461	0.0413	0.240***	-0.0486	-0.217***	1		
8	Non Zero return days	0.381***	0.397***	0.372***	0.362***	0.296***	-0.179***	0.0721*	1	
9	Firms in Industry	0.182***	0.193***	0.203***	0.0602	0.0193	-0.192***	-0.0635	0.0722**	1
10	Trading Volume	0.303***	0.324***	0.317***	0.143***	-0.0206	-0.0994**	0.0297	0.428***	0.0432

Continued on next page

Table 5.2 continued

Panel E: South Africa

		1	2	3	4	5	6	7	8	9
1	$Synch_1$	1								
2	$Synch_2$	0.854***	1							
3	$Synch_3$	0.814***	0.945***	1						
4	Firm Size	0.601***	0.647***	0.665***	1					
5	Age	0.205***	0.216***	0.205***	0.342***	1				
6	Leverage	-0.0950***	-0.0734***	-0.0710***	-0.182***	-0.0929***	1			
7	Profitability	0.168***	0.176***	0.177***	0.340***	0.0112	-0.295***	1		
8	Non Zero return days	0.428***	0.451***	0.447***	0.686***	0.332***	-0.211***	0.165***	1	
9	Firms in Industry	-0.0194	-0.0285	-0.0284	0.0393**	0.0198	0.0868***	-0.00721	-0.0760***	1
10	Trading Volume	0.435***	0.446***	0.444***	0.480***	0.102***	-0.0741***	0.102***	0.571***	-0.0537***

5.4.2 Univariate analysis of synchronicity

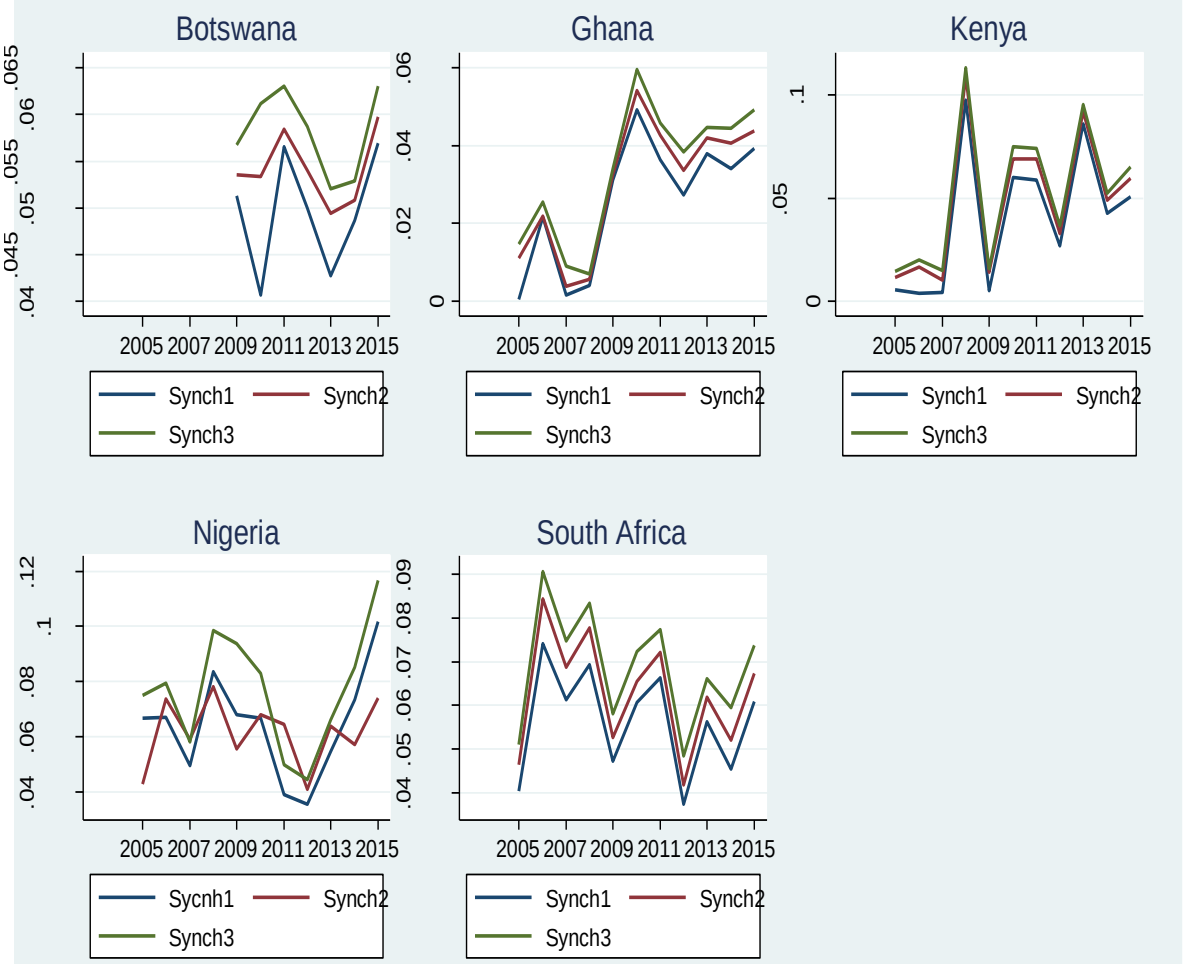
This section presents univariate analysis of synchronicity.

5.4.2.1 Stock return synchronicity over time

Although the summary statistics shown in Table 5.1 reveal an averagely low level of stock return synchronicity in each country over the sample period, it is perhaps necessary to further indicate how synchronicity may have change over the period. Figure 5.1 depicts time series plots of mean synchronicity values for each country over the sample period which indicate the evolution of synchronicity for each country. For the purposes of these plots, the non-log-transformed versions of synchronicity are used. The logged transformed version of synchronicity are only used in regression where synchronicity is a dependent variable. Across all countries in Figure 5.1, the average synchronicity values per year still depict a persistently low level of stock return synchronicity, with the highest being just about 12% in the case of Nigeria ($Synch_3$). It is also important to observe a similarly close pattern of stock return synchronicity in each country across for all three measures. This provides support for Hypothesis 1 about the averagely low level of synchronicity.

However, there appears to be a rise in synchronicity in the crisis period for most countries, giving some support to the conjecture that developing markets might have also experienced its impact through spillovers and contagion. Movements in developed markets, to which these developing markets are exposed, would have triggered significant movements in stock prices giving rise to increasing synchronicity over that period. However whether the changes in synchronicity between the crisis period and other periods represents a statistically significant differences might be a subject of further empirical investigation. Section 5.4.2.3 of this chapter tests mean differences of stock return synchronicity in the crisis periods and non-crisis periods. Although there are hardly studies of stock return synchronicity in African markets, the patterns in Figure 5.1 provide some support for the arguments by Mensah and Alagidede (2017) that dependence of stock returns in African markets is time-varying. One point of departure of their study, however, is that they find dependence to be weak in most African countries except South Africa. It is also important to mention that whilst the patterns of stock synchronicity in Figure 5.1 may depict some interesting trends, these trends do not appear significant as synchronicity is still persistently low on average, over the sample period.

Figure 5.1 Evolution of stock return synchronicity



5.4.2.2 Differences in synchronicity between pairs of countries

Table 5.3 presents results from tests of differences in means of synchronicity between pairs of countries. The objective of this analysis is to compare whether within a set of developing countries, there may be differences in synchronicity in the relatively more developed ones than others. The null hypothesis for each of these tests is that average synchronicity of firms in the country on the left side of the pairing minus average synchronicity of firms in the country of the right side of the pairing is zero. Therefore, a negative value would mean that average synchronicity in the country on the left side is less than average synchronicity in countries on the right side. From the table there is no statistically significant differences between average synchronicity of firms in Botswana and average synchronicity of firms in each of the other four countries. These may be due to the fact that both markets have similar characteristics relative to size and liquidity. However, pairs including Ghana and each of the other three countries (excluding Botswana) show negative and statistically significant differences, implying that synchronicity is lower in Ghana than in Kenya, Nigeria and South Africa. Thus, for a set of generally developing markets, smaller and even less developed markets have a lower level of stock return synchronicity.

Tests involving Kenya and Nigeria and Kenya and South Africa also show negative and statistically significant differences. However, there are no statistical differences between Nigeria and South Africa. This may also be due to the fact that these two market represent the most developed in the sample. Overall, the results from the table point to quite an interesting pattern where synchronicity is higher in the relatively more developed markets than in the less developed ones. Therefore, the size of the relatively more developed markets creates a comparatively more enhanced information environment where, consistent with the views of Dasgupta et al. (2010), market participants become less surprised about the occurrence of corporate events leading to lower reactions and a higher level of stock return synchronicity.

Table 5.3 Test of mean differences in synchronicity between pairs of countries

This table presents tests of mean differences in synchronicity between pairs of countries. The null hypothesis is that stock return synchronicity in the country on the left minus stock return synchronicity in the country on the right is equal to zero.

	$Synch_1$		$Synch_2$		$Synch_3$	
	Mean diff	T-test	Mean diff	T-test	Mean diff	T-test
Botswana- Ghana	0.022	(1.51)	0.023	(1.52)	0.023	(1.55)
Botswana-Kenya	0.008	(0.55)	0.004	(0.30)	0.004	(0.31)
Botswana-Nigeria	-0.013	(-0.93)	-0.018	(-1.27)	-0.019	(-1.30)
Botswana-South Africa	-0.007	(-0.50)	-0.009	(-0.63)	-0.011	(-0.76)
Ghana-Kenya	-0.0144**	(-2.28)	-0.0181***	(-2.80)	-0.0185***	(-2.84)
Ghana-Nigeria	-0.0357***	(-5.79)	-0.0409***	(-6.47)	-0.0417***	(-6.56)
Ghana-South Africa	-0.0294***	(-5.57)	-0.0314***	(-5.82)	-0.0336***	(-6.17)
Kenya- Nigeria	-0.0213***	(-3.95)	-0.0228***	(-4.12)	-0.0232***	(-4.17)
Kenya-South Africa	-0.0150***	(-3.45)	-0.0133***	(-2.98)	-0.0151***	(-3.36)
Nigeria-South Africa	0.006	(1.52)	0.00954**	(2.26)	0.00813*	(1.91)

5.4.2.3 Synchronicity: pre and post financial crises

The Global Financial Crisis (GFC) began in the US. However, due to globalisation and the increasing interdependence of financial markets, markets in other developed as well as emerging markets experienced some spillover effects (Covitz et al. 2013, Bekaert et al. 2014). An and Zhang (2013) argue that the GFC lead to increases in market volatility and stock crash risk which resulted in higher synchronicity in the GFC period relative to the non-GFC period. It is therefore hypothesised that there are significant differences in synchronicity between the GFC period as well as the pre and post GFC periods. In particular, this chapter determines whether stock return synchronicity decreases or increases as a result of the market instability generated outside of African markets. Table 5.4 shows the mean synchronicity values for all three measures of synchronicity in the Pre-Crisis, during the GFC (2007-2009), and Post-Crisis periods for each country. Due to the lack of firm return data for the Botswana sample, synchronicity, for the Pre-Crisis period is not displayed. Using $Synch_1$ as a reference point, the mean synchronicity value for the Ghana sample is 1%, 1.2% and 3.47% in the Pre-GFC, GFC and Post-GFC periods respectively. In the case of Kenya, synchronicity is 0.5%, 3.6% and 5.4% for the three periods respectively indicating a notable increase in synchronicity over the period. This may be due either to the impact of the crisis or may result from institutional and financial development over time. The mean $Synch_1$ figure for the Nigeria sample is 6.7%, 6.5% and 6.1% respectively whilst the sample that of the South Africa sample is 5.8% 5.9%, and 5.4%. For these latter two countries, synchronicity does not appear to have been substantially altered by the advent of the GFC although synchronicity is lower in the later period for both countries.

The pattern shown in Table 5.4 can also be observed for the other two measures of synchronicity and for the Botswana sample, relative to the GFC and Post GFC periods. Synchronicity in the crisis period appears to be marginally higher than in the Pre-crisis period. Panel B reports a test of mean differences between synchronicity in pairs of periods, i.e, Pre-GFC period and GFC periods, GFC and Post-GFC periods, and Pre-GFC and Post-GFC periods. In all tests, the null hypothesis is that synchronicity in the period on the left-hand side minus synchronicity in the period on the right-hand side is equal to zero. Hence a negative t-statistic implies that synchronicity is lower in the period on the left-hand side than in the period on the right-hand side. For example, a t-statistic of -4.07 for Kenya under

Table 5.4: Synchronicity and financial crisis

This table compares average stock synchronicity in the Pre-Crisis, Crisis and Post-Crisis periods for each country. Panel A presents the mean synchronicity values of firms and Panel B presents results for tests of mean differences.

Panel A: Average Synchronicity

	Pre-GFC(2005-2006)			GFC(2007-2009)			Post-GFC(2010-2015)		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Botswana				0.051	0.054	0.057	0.049	0.054	0.059
Ghana	0.011	0.017	0.020	0.012	0.014	0.016	0.037	0.043	0.047
Kenya	0.005	0.014	0.017	0.036	0.045	0.048	0.054	0.062	0.066
Nigeria	0.067	0.074	0.077	0.068	0.081	0.089	0.061	0.070	0.074
South Africa	0.058	0.066	0.071	0.059	0.066	0.072	0.054	0.060	0.066

Panel B: Test of mean differences.

	Pre-GFC —GFC			GFC and Post—GFC			Pre-GFC and Post—GFC		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Botswana				-0.050	-0.02	-0.04			
Ghana	-0.11	-0.300	-0.400	-2.74***	-3.11***	-3.24***	-2.44***	-2.36***	-2.41***
Kenya	-4.07***	-3.60***	-3.59***	-1.91*	-1.73*	-1.82*	-8.49***	-7.23***	-7.36***
Nigeria	-0.05	-0.48	-0.79	0.690	1.170	1.560	0.460	0.330	0.280
South Africa	-0.31	-0.10	-0.14	1.190	1.520	1.390	0.640	1.130	0.970

"Pre-GFC- GFC" implies that synchronicity in the Pre-GFC period was significantly lower than synchronicity in the GFC period. Notable differences can be observed for the Kenyan sample between the Pre-GFC and GFC periods as well as the Pre-GFC and Post-GFC periods. Synchronicity is significantly lower in the Pre-GFC period than in the GFC period. Also, synchronicity is significantly lower in the GFC period than in the Post-GFC period and significantly lower in the Pre-GFC period than in the Post-GFC period. This holds true for all three measures of synchronicity. An almost similar observation can be made in the case of Ghana except for the Pre-GFC and GFC pairs which are not statistically significant. Significant differences can also be observed in Ghana. Hence, in some of the smaller markets, synchronicity increased over the period. One explanation for this might be that investors increased their reliance on market movements given the high levels of uncertainty and volatility of stock prices. However, in the case of Nigeria and South Africa, there appears to be no significant differences between any of the pairs of periods, although synchronicity in the GFC period is higher than in both the Pre-GFC and Post-GFC periods. This therefore implies that despite increased volatility during the GFC, market movements did not have a significantly greater impact on synchronicity of stock returns in both Nigeria and South Africa. Despite the differences observed in the Ghana and Kenya sample, the figures from Panel A of the table show that overall, when synchronicity values are divided into different time periods, we still observe low average levels of synchronicity in all five countries.

5.4.3 Multivariate analysis of synchronicity

The empirical results in this section are organized as follows: Section 5.4.3.1 focuses on the determinants of synchronicity using pooled OLS regression on a country by country basis. Section 5.4.3.2 also considers the determinants of synchronicity by addressing potential concerns of cross-sectional dependence with the pooled OLS regression. Section 5.4.3.3 presents results of the analysis to determine whether synchronicity is influenced by ownership structure in African markets.

5.4.3.1 Determinants of synchronicity

Table 5.5 presents OLS regression estimates of the determinants of synchronicity. The results are presented separately for each country. For each country, there are three models

with each having one of the three measures of synchronicity as the dependent variable. This is done to further ensure the robustness of the findings. Coefficient estimates for firm size are positive and statistically significant across all models in all countries. This implies that returns of larger firms tend are relatively more synchronous than smaller firms. Thus, the second hypothesis of this chapter, that returns of larger firms are more synchronous, is supported. This is consistent with the arguments of Roll (1988) and the findings of Piotroski and Roulstone (2004) and Boubaker et al. (2014). Piotroski and Roulstone (2004) for example, argue that the size of firms is a good indicator of the size of its information environment including overall investor interest and media exposure. Large firms may serve as leading market indicators by signaling macroeconomic trends which have the potential to trigger similar aggregate markets movements. Roll (1988) provides another explanation for why larger firms may exhibit greater synchronicity. He posits that larger firms usually tend to operate in different markets and industries, and can, therefore, be likened to a diversified portfolio of smaller firms. Thus, by operating in these different markets and industries, larger firms have greater exposure and will be more susceptible to the impact of market-wide factors. A key implication of this finding for African markets is that firm size is a key factor in helping to explain the nature and movement of stock returns. Although, the computation of stock return synchronicity (R^2), is not necessarily a test of an asset pricing model (Jin and Myers 2006), the co-efficient estimates on firm size from Table 5.5 may lend some support to the role of size in explaining the cross section of stock returns in African markets which have been established in some previous studies of African markets (Hearn and Piesse 2010, Hearn 2012, Hearn 2014).

With regards to firm age, coefficient estimates are less consistent across all countries. Age is statistically insignificant for Botswana, Ghana, Kenya, and Nigeria. However, it is positive and highly significant (at the 1% level) for South African firms across all three different measures of synchronicity. This implies that older firms are more synchronous in the South African sample but not elsewhere. The positive and significant coefficient for Age in South Africa is consistent with the findings by Dasgupta et al. (2010) who argue that the market learns about a firm's time-invariant characteristics as it gets older. Therefore, more market-wide factors will be incorporated into its stock price, leading to high synchronicity. Further, Dasgupta et al. (2010) argue that older firms tend to have more stable fundamentals and will therefore co-move, leading to greater return synchronicity. The difference in the impact of age between South Africa and the other four countries could reflect the wide disparities in stock market development. The South African market is the largest and one of the oldest markets on the continent. Hence the implications of age for

any firm level outcomes will be more pronounced as markets have had more time to learn about the company. On the whole, and given the results presented in Table 5.5, the third hypothesis, which indicates that older firms in African markets are more synchronous, is not supported. South Africa, however, remains an exception.

In terms of the other variables in Table 5.5, *Leverage* is insignificant in Botswana, Ghana, Kenya, and Nigeria, consistent with Gul et al. (2010) and Boubaker et al. (2014) who also do not find any statistically significant impact of leverage on synchronicity. In South Africa, however, *Leverage* has a positive and significant impact on synchronicity, lending support to the notion that, as leverage transfers ownership from equity to debtholders, stock prices of firms will incorporate less or no firm-specific information. *Profitability* is positive and significant across two models in Botswana but insignificant for the Ghana, Kenya, and Nigeria sample. In South Africa, and contrary to the case of Botswana, profitability is negative and statistically significant across all three measures of synchronicity. *Non-Zero Return Days* has no statistically significant impact on synchronicity in Botswana and Ghana. These might be due to the fact that these two countries are relatively less liquid compared to Kenya, Nigeria and South Africa where coefficient estimates of this variable, consistent with Chan et al. (2013), are positive and significant. This finding suggests that stocks that trade more often are also more likely to be driven by market wide-forces and therefore exhibit higher levels of synchronicity. Using a different measure for liquidity, Feng et al. (2016) find that illiquidity has a negative impact on synchronicity which is consistent with the findings in this study as far as Kenya, Nigeria and South Africa are concerned. This contrasts with the findings of Boubaker et al. (2014) who find that less liquid stocks incorporate less firm-specific information and are therefore more synchronous. The number of firms in the industry (*Firms in Industry*) is insignificant in all five countries. This is consistent with Gul et al. (2010) and Hasan et al. (2014) who also do not find any statistically significant impact. This also suggests that industry-wide factors may not be very relevant for movement in prices of individual stocks. Finally, trading volume is not significant for Botswana, Ghana and Kenya, but positive and significant for the Nigerian and South African samples. The findings in the case of Nigeria and South African support the findings in Xing and Anderson (2011) who also find a positive impact of trading volume on synchronicity. This also explains why Non-Zero Return equally has a positive impact in the case of Nigeria and Nigeria as more traded stocks are likely to be more liquid.

Table 5.5: Firm determinants of synchronicity

This table presents results of OLS regression estimates on the determinants of synchronicity. *Synch$_1$, Synch$_2$, and Synch$_3$* are the dependent variables. *Synch$_1$* is the R-squared from a regression of firm's stock returns on the contemporaneous market return. *Synch$_2$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return and the lagged market return. *Synch$_3$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return, lagged market return as well as the world market return. *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Age* is the log of the number of years since a firm's base date in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Profitability* is measured as operating income scaled by Total Assets. *Non-Zero return days* is the number of days a firm has non-zero returns in the previous year. *Log (Firms in Industry)* is the log of the number of firms in the industry to which a firm belongs. *Trading Volume* is the total trading volume of a firm in each year scaled by the number of shares outstanding at the year-end. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	Botswana			**Ghana**		
	Synch$_1$	Synch$_2$	Synch$_3$	Synch$_1$	Synch$_2$	Synch$_3$
Firm Size	0.9480***	0.6095**	0.5624**	0.9177***	0.6229***	0.4334***
	(3.01)	(2.38)	(2.51)	(5.31)	(4.91)	(3.93)
Age	-0.6834	-0.6300	-0.5775	11.8820	0.4465	-1.7142
	(-1.08)	(-1.44)	(-1.48)	(1.46)	(0.11)	(-0.45)
Leverage	2.3733	0.0861	0.4823	-0.5218	0.3261	0.8756
	(0.83)	(0.04)	(0.23)	(-0.34)	(0.32)	(1.03)
Profitability	6.6970	11.3002***	9.0903**	-2.7996	0.8611	1.0128
	(1.13)	(3.30)	(2.27)	(-0.81)	(0.51)	(0.75)
Non-zero return days	2.8032	5.1175	4.0061	4.4941	2.4048	2.2788
	(0.38)	(0.94)	(0.73)	(1.19)	(0.80)	(0.91)
Firms in Industry	0.0000	0.0000	0.0000	0.0885	0.1700	0.1229
	(0.00)	(0.00)	(0.00)	(0.26)	(0.71)	(0.67)
Trading Volume	0.4137	-0.0342	-0.0356	0.0368	0.1814	0.0470
	(1.50)	(-0.18)	(-0.21)	(0.10)	(1.32)	(0.37)
Constant	-9.6997***	-9.0563***	-7.2829***	-31.6845**	-8.1241	-3.4793
	(-4.36)	(-5.29)	(-4.77)	(-2.18)	(-1.02)	(-0.49)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	60	60	60	86	86	86
Adj. R^2	0.311	0.344	0.286	0.419	0.503	0.328

Continued on next page

Table 5.5 continued

	Kenya			Nigeria		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.4828***	0.3668***	0.3208***	0.7203***	0.5199***	0.4617***
	(4.60)	(5.00)	(5.98)	(9.75)	(10.80)	(11.72)
Age	0.2422	0.0354	0.0132	0.0340	0.0297	0.1271
	(1.03)	(0.24)	(0.11)	(0.06)	(0.08)	(0.33)
Leverage	1.3004	0.6964	0.5996	-0.4594	-0.2972	-0.5563
	(1.02)	(0.88)	(1.02)	(-0.54)	(-0.48)	(-1.21)
Profitability	0.6397	0.7556	0.6961	-0.4992	-0.0421	0.0447
	(0.25)	(0.56)	(0.63)	(-0.20)	(-0.04)	(0.06)
Non-zero return days	3.0885***	2.2105***	1.9311***	3.2711***	3.0956***	2.5440***
	(3.27)	(3.38)	(3.77)	(4.69)	(7.33)	(7.20)
Firms in Industry	0.0751	-0.0124	0.0219	0.2550	0.3431*	0.3715**
	(0.50)	(-0.12)	(0.25)	(1.20)	(1.77)	(2.30)
Trading Volume	-0.0354	0.0628	0.1237	0.3992***	0.2728***	0.2195***
	(-0.18)	(0.65)	(1.53)	(3.14)	(3.24)	(3.23)
Constant	-10.5442***	-7.0910***	-6.2717***	-8.6522***	-8.0722***	-7.7802***
	(-7.55)	(-7.16)	(-8.15)	(-5.59)	(-6.19)	(-6.81)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	323	323	323	291	291	291
Adj. R^2	0.423	0.421	0.466	0.541	0.581	0.653

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Table 5.5 continued

	South Africa			Excl. South Africa		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.5984***	0.4397***	0.3852***	0.6658***	0.4494***	0.3972***
	(19.26)	(22.06)	(24.78)	(12.28)	(13.14)	(13.84)
Age	0.1724***	0.1482***	0.1283***	-0.1595	-0.2335***	-0.2348***
	(3.02)	(4.06)	(4.26)	(-1.43)	(-3.11)	(-3.61)
Leverage	0.3456	0.4447***	0.3816***	0.4374	0.2131	0.3171
	(1.47)	(3.04)	(3.19)	(0.72)	(0.51)	(1.02)
Profitability	-0.6925**	-0.4159**	-0.4169***	-0.6993	0.1860	0.1261
	(-2.34)	(-2.28)	(-2.89)	(-0.53)	(0.22)	(0.20)
Non-zero return days	0.5667	0.8094***	0.6875***	2.4446***	2.2187***	1.8644***
	(1.47)	(3.38)	(3.65)	(4.92)	(6.97)	(6.78)
Firms in Industry	-0.0196	-0.1885*	-0.1132	0.0021	-0.1151	-0.0903
	(-0.06)	(-1.77)	(-1.20)	(0.01)	(-0.94)	(-0.88)
Trading Volume	0.3391***	0.2137***	0.1781***	0.1353	0.0848	0.0439
	(7.32)	(7.49)	(7.64)	(1.46)	(1.59)	(0.98)
Constant	-7.2533***	-5.0487***	-4.8664***	-8.3965***	-5.7900***	-5.2809***
	(-3.55)	(-7.79)	(-8.51)	(-8.58)	(-8.05)	(-8.73)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	2373	2373	2373	760	760	760
Adj. R^2	0.448	0.520	0.547	0.414	0.435	0.461

Overall, based on the pooled OLS regression model, the results in this section suggest that the main determinant of synchronicity of firms across all countries is firm size, as this is consistently positive and significant in each of the countries. This is still the case when the South African sample is compared to a combined sample of the other four countries. As already mentioned earlier, this points to the importance of firm size in a firm's information environment and to some extent, the relevance of firm size in helping to explain stock returns in African markets. The impact of other variables including *Age*, *Leverage*, *Profitability*, *Non-Zero return days*, *Firms in Industry* and *Trading Volume* is less consistent across all countries. These differences may indicative of the differences in the development of the respective stock markets.

5.4.3.2 Fama-MacBeth regressions

Regression results from the Fama-Macbeth two-step procedure are presented in Table 5.6. As already mentioned in Chapter 4, this analysis is done to address any potential concerns of cross-sectional dependence, and has be employed in some previous studies of synchronicity (Boubaker et al. 2014, Feng et al. 2016). Consistent with the pooled OLS regression results, *Firm Size* continues to have a positive and significant impact on synchronicity in all five countries except in models 2 and 3 of the Botswana sample, providing further evidence in support of the second hypothesis of this chapter. Thus, the impact of firm size on stock return synchronicity in the sampled markets is not affected by any cross-sectional dependence. Also, *Age* is statistically insignificant for Botswana, Ghana, Kenya and Nigeria but statistically significant for the South African sample, similar to the results from the pooled OLS regressions. Leverage is also positive and significant for the South African sample but not in the case of the other four countries. Further, *Non-Zero Return Days* and *Trading Volume* are both positive and significant in Kenya, Nigeria and South Africa but not Ghana and Botswana. Overall, the results from Table 5.6 show that the determinants of synchronicity in these markets are not driven by cross-sectional correlation of errors as the results from the Fama-Macbeth regressions are qualitatively similar to those obtained from the pooled OLS regressions.

Table 5.6: Fama-MacBeth regressions

This table presents results of Fama MacBeth regression estimates on the determinants of synchronicity. *$Synch_1$, $Synch_2$, and $Synch_3$* are the dependent variables. *$Synch_1$* is the R-squared from a regression of firm's stock returns on the contemporaneous market return. *$Synch_2$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return and the lagged market return. *$Synch_3$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return, lagged market return as well as the world market return. *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Age* is the log of the number of years since a firm's base date in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Profitability* is measured as operating income scaled by Total Assets. *Non-Zero return days* is the number of days a firm has non-zero returns in the previous year. *Firms in Industry* is the log of the number of firms in the industry to which a firm belongs. *Trading Volume* is the total trading volume of a firm in each year scaled by the number of shares outstanding at the year-end. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively

	Botswana			**Ghana**		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	1.3491**	0.8910	0.5901	1.0554**	0.6875**	0.5394***
	(3.08)	(1.83)	(1.34)	(4.01)	(4.16)	(5.41)
Age	0.0000	0.0000	0.0000	10.5378	3.3409	3.3446
	(0.00)	(0.00)	(0.00)	(1.03)	(1.03)	(1.03)
Leverage	19.1596	4.9539	0.0433	1.9096	2.4669	2.5425
	(0.86)	(0.40)	(0.01)	(0.74)	(1.51)	(1.73)
Profitability	-52.0796	-5.0076	9.9297	18.6422	21.1698	19.8293
	(-0.82)	(-0.16)	(0.46)	(1.18)	(1.45)	(1.54)
Non-zero return days	-70.1089	-24.5419	-15.3283	6.5163	3.7809	4.2486
	(-0.76)	(-0.65)	(-0.65)	(1.39)	(1.51)	(2.05)
Firms in industry	0.0000	0.0000	0.0000	1.1813**	0.8909**	0.7088***
	(0.00)	(0.00)	(0.00)	(4.23)	(3.99)	(5.80)
Trading Volume	1.2886	0.0530	-0.2304	0.2701	0.0456	0.0031
	(0.78)	(0.06)	(-0.36)	(0.49)	(0.14)	(0.01)
Constant	8.4120	-4.8868	-7.0914	-34.8985	-18.5145*	-17.1401*
	(0.37)	(-0.47)	(-1.01)	(-1.80)	(-2.76)	(-2.65)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	60	60	60	86	86	86
Average. R^2	0.864	0.847	0.833	0.860	0.816	0.771

Continued on next page

Table 5.6 continued

	Kenya			Nigeria		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.3187**	0.3345***	0.1826	0.7507***	0.5652***	0.5022***
	(2.77)	(5.89)	(1.62)	(14.58)	(16.84)	(11.43)
Age	-0.1162	0.1858	0.1972	2.2999	1.7235	1.4971
	(-0.34)	(0.88)	(0.95)	(1.07)	(1.13)	(1.18)
Leverage	-0.0228	-0.8287	-0.3936	-0.3911	-0.2133	-0.4876**
	(-0.02)	(-1.26)	(-0.67)	(-1.16)	(-1.38)	(-3.58)
Profitability	0.1117	-0.4138	0.0949	-1.2214	-1.4291	-1.0759
	(0.06)	(-0.38)	(0.09)	(-1.02)	(-1.27)	(-1.18)
Non-zero return days	2.4895*	1.9778**	1.4940**	3.5162**	3.1863***	2.6185***
	(1.99)	(2.25)	(2.55)	(4.22)	(7.79)	(8.37)
Firms in industry	-0.2189	-0.2811*	-0.1762*	0.1330	0.1352*	0.1942*
	(-1.14)	(-2.14)	(-1.85)	(0.98)	(2.21)	(2.65)
Trading Volume	0.2572	0.2037*	0.3220***	0.3476**	0.2318***	0.1926***
	(1.36)	(1.92)	(3.96)	(3.68)	(7.93)	(8.45)
Constant	-6.2031***	-5.6859***	-4.4868***	-11.7429**	-9.8643***	-9.1664***
	(-4.01)	(-6.93)	(-5.39)	(-3.78)	(-4.91)	(-4.91)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	323	323	323	291	291	291
Average. R^2	0.641	0.712	0.713	0.663	0.660	0.724

Continued on next page

Table 5.6 continued

	South Africa			Excl. South Africa		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.5989***	0.4449***	0.3891***	0.4213***	0.3721***	0.2103
	(16.44)	(17.06)	(22.95)	(3.41)	(6.14)	(1.80)
Age	0.1945***	0.1562***	0.1369***	-0.3811	0.0342	0.0451
	(4.52)	(4.32)	(5.02)	(-1.38)	(0.14)	(0.19)
Leverage	0.2280	0.3753**	0.3252**	0.2380	-0.3003	0.2313
	(1.04)	(2.56)	(2.57)	(0.33)	(-0.45)	(0.43)
Profitability	-0.7471***	-0.5533**	-0.4773***	0.3419	0.0710	0.7646
	(-3.90)	(-3.16)	(-3.53)	(0.19)	(0.08)	(1.05)
Non-zero return days	0.6974	0.9158*	0.6976*	3.2730***	2.6218***	2.0514***
	(1.11)	(2.03)	(1.87)	(3.74)	(3.88)	(5.00)
Firms in industry	-0.1022	-0.2170**	-0.1328	-0.0691	-0.2008	-0.0989
	(-0.40)	(-2.41)	(-1.74)	(-0.47)	(-1.52)	(-1.21)
Trading Volume	0.3241***	0.1991***	0.1758***	0.0860	0.0721	0.1325**
	(5.34)	(5.16)	(4.61)	(0.68)	(1.01)	(2.78)
Constant	-7.1154***	-5.1882***	-4.9748***	-7.0015***	-6.3143***	-5.1716***
	(-4.17)	(-9.59)	(-10.30)	(-5.30)	(-8.86)	(-7.55)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	2373	2373	2373	760	760	760
Average. R^2	0.496	0.551	0.576	0.574	0.622	0.620

5.4.3.3 Ownership structure and synchronicity

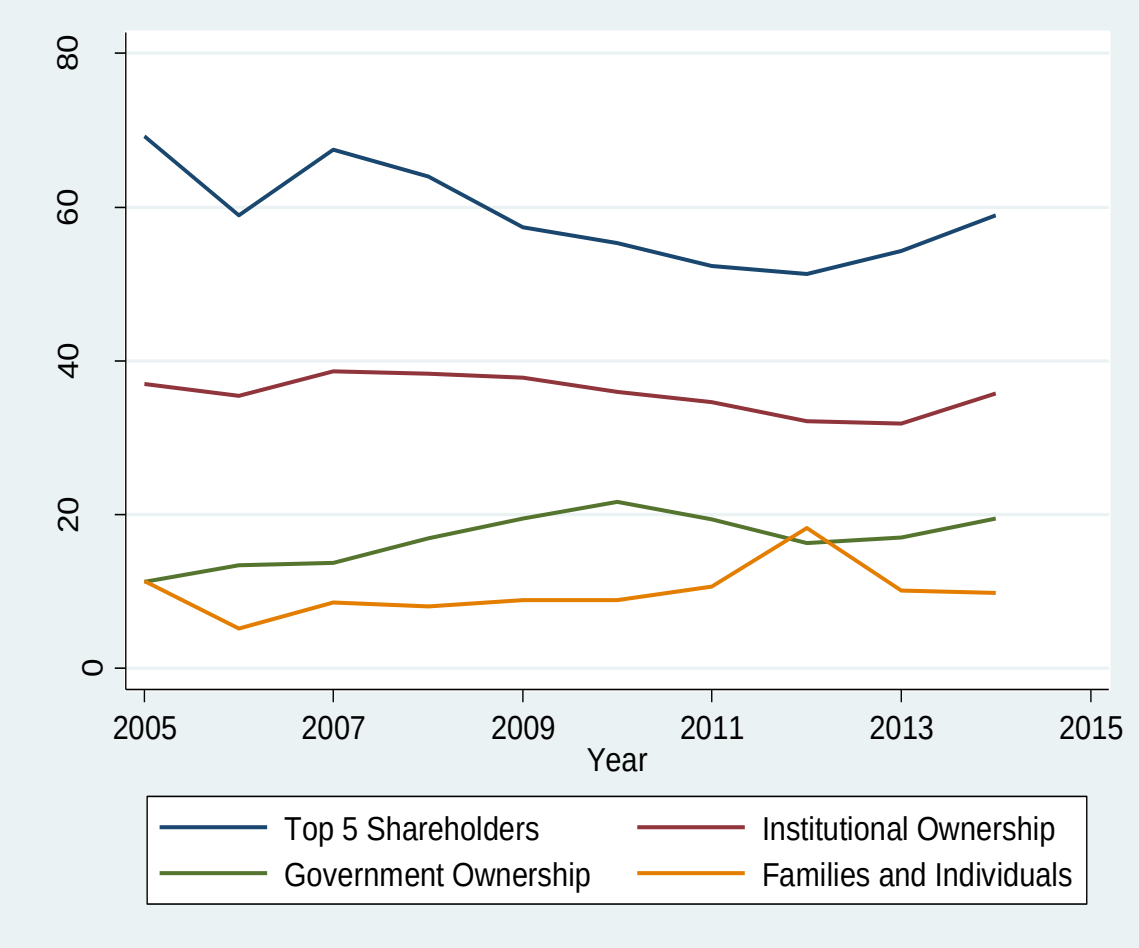
This chapter next investigates whether synchronicity is influenced by ownership structure. The main ownership variables of interest are the level of ownership concentration (Top 5 shareholders), the percentage of shares directly held by government/government institutions (Government Ownership), the percentage of shares directly held by institutional investors (Institutional Ownership) and the percentage of shares directly held by Families and Individuals (Families and Individuals). This analysis is limited to only shares directly held by the different types of shareholders. Due to constraints with data availability, more complex ownership structures such as pyramids and ultimate owners cannot be examined.

Figure 5.2 depicts the evolution of ownership in terms of these four variables of interest. Ownership appears to have remained relatively stable over the sample period especially in the post 2007 period. Throughout the sample period, the level of institutional ownership has remained above government ownership. However, a closer look also suggests that the gap between institutional ownership and government ownership appears narrower relative to the period prior. Interestingly the influence of family and individual ownership has also persistently remain lower than the rest of the three structures over the period.

Table 5.7 presents a description of the ownership data by way of summary statistics for each country. The highest level of ownership concentration is found in Botswana with the Top 5 shareholders directly holding an average of 69% of the shares. This is followed by Kenya and Ghana with 66% and 62% respectively. Nigeria and South Africa both have Top 5 shareholders directly holding less than 60% of company stock. The few number of observations is worthy of note. This is due to many instances of missing observations. Despite this limitation, the statistics on ownership concentration are quite consistent previous studies of Markets as indicated in Chapter 2 of the thesis (eg. Tsamenyi et al. 2007, Ongore et al. 2011). These studies find the level of percentage of shares held by top 3-5 shareholders to be greater than 50% Botswana also has the largest percentage of shares directly held by institutional investors (60%) with Kenya having the lowest. Kenya has the

largest proportion of shares directly held by the Government whilst Botswana has the largest percentage of shares directly held by families and individuals.[7]

Figure 5.2: Evolution of ownership structure for sample markets



[7] It is important to stress that the summary statistics for Botswana could be influenced by the relatively small number of observations.

Table 5.7: Summary statistics of ownership data

This table presents summary statistics of ownership data for each country.

Panel A: Botswana

	Count	Mean	SD	Min	Median	Max
Top 5 Shareholders	62	0.693	0.190	0.172	0.726	1.000
Institutional Ownership	62	0.595	0.239	0.107	0.631	0.939
Government Ownership	0	.	.	.	.	.
Families and Individuals	17	0.146	0.137	0.005	0.120	0.534

Panel B: Ghana

	Count	Mean	SD	Min	Median	Max
Top 5 Shareholders	110	0.617	0.267	0.054	0.661	0.972
Institutional Ownership	110	0.467	0.304	0.013	0.406	0.965
Government Ownership	26	0.217	0.162	0.001	0.214	0.427
Families and Individuals	60	0.076	0.124	0.002	0.026	0.557

Panel C: Kenya

	Count	Mean	SD	Min	Median	Max
Top 5 Shareholders	160	0.659	0.186	0.054	0.690	1.000
Institutional Ownership	160	0.267	0.258	0.007	0.175	0.948
Government Ownership	42	0.253	0.168	0.011	0.227	0.600
Families and Individuals	108	0.065	0.064	0.003	0.035	0.261

Panel D: Nigeria

	Count	Mean	SD	Min	Median	Max
Top 5 Shareholders	214	0.524	0.250	0.093	0.507	1.000
Institutional Ownership	214	0.297	0.195	0.015	0.256	0.830
Government Ownership	11	0.112	0.209	0.002	0.021	0.534
Families and Individuals	64	0.100	0.099	0.000	0.079	0.557

Panel E: South Africa

	Count	Mean	SD	Min	Median	Max
Top 5 Shareholders	1330	0.564	0.243	0.054	0.569	1.000
Institutional Ownership	1330	0.353	0.233	0.007	0.300	0.965
Government Ownership	44	0.090	0.048	0.014	0.104	0.184
Families and Individuals	621	0.103	0.125	0.000	0.054	0.557

Table 5.8 presents regression results for the impact of ownership structure on synchronicity. Similar to previous regressions in this chapter, industry and year dummies are included. Due to the limited number of observations in each country, results are presented for the full sample rather than by country. However, to ensure that the results are not driven by the inclusion of South African sample, which is disproportionately larger than each of the other four countries, a separate set of results are presented for a sample that excludes South Africa. Country dummies are included to address the impact of any particular country effects.

The results in Table 5.8 do not provide any evidence in support of the hypothesis that synchronicity is influenced by ownership structure. Therefore, hypotheses 4,5, 6 and 7 are not supported. For the full sample, none of the coefficients of the ownership variables are statistically significant. In the sample that excludes South Africa, only a weakly significant relationship is found between synchronicity and Government Ownership, and Families and Individuals. The findings from this regressions contrast with previous studies on synchronicity and ownership structure. Gul et al. (2010), using the percentage of shares held by the largest shareholder as a measure of ownership concentration, find a positive and significant relationship between synchronicity and ownership concentration. They further find this relationship to be more pronounced when the largest shareholder is government-related. However, and consistent with the alignment effect posited by Fan and Wong (2002), the relationship they find between synchronicity and ownership concentration is concave. Beyond a level of ownership concentration, synchronicity starts to decrease. This is because, at a certain high level of ownership concentration, there is no further entrenchment irrespective of the increase in voting rights. However, the majority shareholder(s) will find it more costly to divert firm resources for private gain due to the significant cash flow rights they possess. An and Zhang (2013) find that the level of institutional holdings has a significantly negative impact on synchronicity suggesting that firms with higher levels of institutional ownership are less synchronous. They, however, draw an important distinction between dedicated investors, who have a greater incentive to monitor managers by virtue of their large holdings and long-term orientation, and transient investors, who monitor managers weakly owing to their small holdings and short-termism. Whilst they find synchronicity to be lower in the case of the former, they find it to be higher in the case of the latte

Table 5.8: Ownership structure and synchronicity

This table presents results of OLS regression estimates of the impact of ownership structure on synchronicity. The dependent variable is $Synch_1$. To preserve space, the variable definitions are excluded from this table. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

Dependent Variable: Synch1								
	Full Sample				**Excl. South Africa**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top 5 Shareholders	0.3614				0.0009			
	(1.49)				(0.00)			
Institutional Ownership		0.2295				-0.4775		
		(0.91)				(-0.93)		
Government Ownership			4.5054				6.7040*	
			(1.16)				(1.73)	
Families and Individuals				1.0514				3.8261*
				(1.15)				(1.76)
Firm Size	0.6609***	0.6605***	1.8130***	0.6429***	0.8368***	0.8476***	2.1007***	0.9851***
	(16.32)	(16.33)	(4.34)	(10.48)	(9.36)	(9.50)	(4.51)	(6.38)
Age	0.2387**	0.2329**	0.0838	0.3341**	0.4127	0.4595	1.2418	0.3846
	(2.51)	(2.43)	(0.04)	(2.31)	(1.03)	(1.14)	(0.58)	(0.80)
Leverage	0.1164	0.1015	3.4969	0.4065	0.4588	0.5333	2.0620	2.3753**
	(0.31)	(0.27)	(1.51)	(0.62)	(0.50)	(0.59)	(0.76)	(2.07)
Profitability	-0.4973	-0.4628	-7.7850	-1.9290**	-1.8079	-1.5684	-15.6239	-5.6716
	(-0.94)	(-0.88)	(-0.66)	(-2.07)	(-0.65)	(-0.56)	(-0.63)	(-1.45)
Non-zero return days	-0.4082	-0.4426	5.4817	-0.3981	1.5969	1.6093	5.8885	-0.8257
	(-0.73)	(-0.80)	(1.38)	(-0.56)	(1.47)	(1.52)	(1.44)	(-0.64)
Firms in industry	-0.2831**	-0.2892**	-0.5540	-0.2905**	-0.4143	-0.4301	-0.2554	-0.1980
	(-2.51)	(-2.57)	(-0.56)	(-2.42)	(-0.96)	(-1.01)	(-0.37)	(-1.47)
Trading Volume	0.4131***	0.4023***	-0.1032	0.3997***	0.2078	0.2044	-0.2843	0.3424
	(5.78)	(5.62)	(-0.27)	(3.77)	(1.22)	(1.27)	(-0.60)	(1.25)
								-8.2378***
Constant	-5.5702***	-5.4104***	-18.5288***	-5.7531***	-8.2180***	-8.2712***	-16.4245***	
	(-7.02)	(-7.04)	(-2.87)	(-5.91)	(-3.94)	(-3.98)	(-4.09)	(-3.52)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1122	1122	54	552	235	235	44	120
Adj. R^2	0.482	0.482	0.430	0.433	0.498	0.500	0.426	0.498

Regressions which test for the impact of ownership structure on stock return synchronicity, where $Synch_1$ and $Synch_2$ are dependent variables, have also been carried out, and results of these are presented in Appendices 5.1 and 5.2 respectively. Consistent with the results in Table 5.8, co-efficient estimates of the ownership variables are not statistically significant and lends more support to the finding that stock return synchronicity in African markets appear not to be influenced by ownership structure. The results in Table 5.8 are therefore robust to different measures of stock return synchronicity.

5.5 Additional analyses and robustness tests

This section presents some robustness checks. These include re-estimating the level of synchronicity using non-zero firm returns and also employing an alternative estimation technique to ascertain the determinants of synchronicity.

Synchronicity from non-zero firm returns

A major characteristic of developing markets/emerging markets in general and African markets, in particular, is the issue of thin-trading. This is manifested in the many zero returns associated with stocks[8]. Therefore, one may argue that the low level of synchronicity is due to the infrequent nature with which prices change in this market. Whilst the percentage of non-zero return days has been included as a control in the regressions, an attempt is made to more directly address the above concern by re-computing synchronicity by using only non-zero return firm observations and their corresponding market or world returns.

Table 5.9 presents summary statistics of the synchronicity figures. Although noticeable increases in synchronicity can be observed, especially for Botswana and Ghana, overall, they still remain relatively stable. Table 5.9 shows that synchronicity is lower than might be expected compared to previous literature for the markets in this study. The average level of synchronicity for emerging markets was found to be upwards of 40% in Morck et al (2000)—43%, 45% and 57% for Malaysia, China, and Poland respectively. In Jin and Myers (2006), it is found to be between 27% and 47%. Table 5.10 presents synchronicity constructed from non-zero returns by year. Although the figures in this

[8] In the next chapter of this thesis, the percentage of non-zero returns is used as a basis to select stocks to test the impact of corporate information as the problems of thin trading are more pronounced in event study settings as opposed to measures of synchronicity.

table show higher values of synchronicity, they still point to a generally lower level of stock return synchronicity than will be expected for a developing markets.

Table 5.9: Synchronicity excluding zero return firm observations

This table presents summary statistics of synchronicity figures where zero return firm observations are excluded.

	N	$Synch_1$		$Synch_2$		$Synch_3$	
		Mean	Median	Mean	Median	Mean	Median
Botswana	103	0.183	0.046	0.27	0.162	0.366	0.26
Ghana	215	0.164	0.047	0.239	0.105	0.337	0.213
Kenya	475	0.06	0.015	0.077	0.026	0.088	0.035
Nigeria	755	0.115	0.06	0.149	0.082	0.176	0.099
South Africa	3119	0.088	0.03	0.108	0.051	0.124	0.065

Table 5.11 presents regression results on the determinants of synchronicity using the three specifications of synchronicity as the dependent variable. Firm size continues to be the main driver of synchronicity. In the case of Botswana, this is only significant for $Synch_1$. In Ghana, firm size loads positively and significantly on both $Synch_2$ and $Synch_3$. For Kenya, Nigeria and South Africa, it loads positively on all three measures. Age also remains significant in South Africa. One notable differences in Table 5.11 compared to the earlier tables is that Age is significant in the Ghana sample. But overall, the results presented in these table are qualitatively similar to those presented in earlier tables where synchronicity was constructed from returns that included zero returns. Therefore, the results on the determinants of stock return synchronicity are not driven by the inclusion of zero returns in the sample.

Table 5.10 : Synchronicity from non-zero returns by year

This table presents synchronicity computed from only non-zero return firm observations by year.

	Botswana			Ghana			Kenya			Nigeria			South Africa		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
2005				0.095	0.178	0.417	0.011	0.036	0.050	0.104	0.160	0.175	0.072	0.096	0.112
2006				0.145	0.256	0.455	0.006	0.032	0.038	0.087	0.094	0.100	0.111	0.136	0.152
2007				0.080	0.128	0.274	0.007	0.039	0.051	0.066	0.080	0.092	0.096	0.113	0.130
2008				0.034	0.150	0.298	0.131	0.141	0.149	0.123	0.129	0.145	0.101	0.123	0.138
2009	0.218	0.305	0.354	0.284	0.407	0.545	0.028	0.063	0.084	0.129	0.171	0.219	0.077	0.097	0.115
2010	0.129	0.203	0.251	0.197	0.249	0.298	0.085	0.092	0.102	0.117	0.148	0.170	0.095	0.116	0.132
2011	0.181	0.206	0.280	0.197	0.289	0.341	0.083	0.099	0.108	0.072	0.101	0.133	0.102	0.123	0.137
2012	0.177	0.296	0.353	0.171	0.254	0.344	0.045	0.054	0.062	0.103	0.141	0.157	0.064	0.077	0.092
2013	0.129	0.208	0.342	0.138	0.159	0.183	0.119	0.137	0.147	0.104	0.129	0.151	0.083	0.101	0.118
2014	0.236	0.303	0.409	0.185	0.272	0.330	0.061	0.067	0.076	0.118	0.178	0.211	0.071	0.088	0.105
2015	0.218	0.380	0.591	0.239	0.262	0.296	0.066	0.078	0.087	0.199	0.224	0.258	0.095	0.115	0.133

Table 5.11: Synchronicity constructed with non-zero returns of firms

This table presents results of OLS regression estimates on the determinants of synchronicity where synchronicity is computed using non-zero firm returns. *Synch₁, Synch₂, and Synch₃* are the dependent variables. *Synch₁* is the R-squared from a regression of firm's stock returns on the contemporaneous market return. *Synch₂* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return and the lagged market return. *Synch₃* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return, lagged market return as well as the world market return. *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Age* is the log of the number of years since a firm's base date in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Profitability* is measured as operating income scaled by Total Assets. *Non-Zero return days* is the number of days a firm has non-zero returns in the previous year. *Firms in industry* is the log of the number of firms in the industry to which a firm belongs. *Trading Volume* is the total trading volume of a firm in each year scaled by the number of shares outstanding at the year-end. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	Botswana			**Ghana**		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.7490**	0.3514	0.2072	0.5817**	0.3407**	0.2197
	(2.16)	(1.42)	(0.89)	(2.63)	(2.65)	(1.65)
Age	-0.5468	0.1912	0.5460	30.0137***	18.2648***	19.3985***
	(-0.67)	(0.45)	(1.19)	(3.66)	(3.52)	(4.11)
Leverage	-2.9530	-0.9049	-0.6872	-0.2810	0.1757	0.3107
	(-0.86)	(-0.45)	(-0.33)	(-0.15)	(0.13)	(0.24)
Profitability	-0.2352	7.1364**	4.4121	7.4594	3.4391	6.5261
	(-0.05)	(2.18)	(1.13)	(1.12)	(0.81)	(1.48)
Non-zero return days	10.7495	2.4256	2.9766	4.1668	0.6320	0.3543
	(1.61)	(0.43)	(0.52)	(0.98)	(0.28)	(0.16)
Firms in industry	0.0000	0.0000	0.0000	0.8155*	0.5359***	0.5627***
	(0.00)	(0.00)	(0.00)	(1.71)	(2.90)	(3.15)
Trading Volume	0.0089	-0.1744	-0.3055	0.0201	-0.0011	-0.0572
	(0.03)	(-1.00)	(-1.66)	(0.07)	(-0.01)	(-0.36)
Constant	-7.2970***	-5.6814***	-4.3670***	-65.3000***	-39.8648***	-41.5287***
	(-3.98)	(-4.09)	(-3.10)	(-4.41)	(-4.07)	(-4.71)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	57	57	57	73	73	73
Adj. R^2	0.242	0.249	0.124	0.119	0.079	0.127

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Table 5.11 continued

	Kenya			Nigeria		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.4306***	0.3256***	0.3144***	0.6141***	0.4233***	0.3617***
	(4.11)	(4.53)	(5.88)	(7.81)	(8.92)	(7.63)
Age	0.3427	0.0457	0.0770	0.1676	0.3080	0.3076
	(1.42)	(0.37)	(0.69)	(0.35)	(0.64)	(0.76)
Leverage	2.3774*	1.3886*	1.0794*	-0.7379	-0.5753	-0.8151
	(1.95)	(1.84)	(1.78)	(-0.76)	(-1.01)	(-1.58)
Profitability	0.5022	-0.4813	-0.5803	0.3527	0.4079	-0.4170
	(0.22)	(-0.33)	(-0.44)	(0.12)	(0.23)	(-0.27)
Non-zero return days	0.1211	-0.4443	-0.7644	1.1591*	0.6169	0.2794
	(0.14)	(-0.72)	(-1.59)	(1.67)	(1.39)	(0.68)
Firms in industry	-0.2688	-0.1954	-0.1825*	0.4891	-0.1061	-0.0517
	(-1.40)	(-1.23)	(-1.70)	(1.18)	(-0.46)	(-0.24)
Trading Volume	-0.0088	-0.0124	0.0033	0.3228*	0.1356	0.0914
	(-0.05)	(-0.12)	(0.04)	(1.93)	(1.35)	(0.96)
Constant	-7.9225***	-5.0556***	-4.4269***	-7.9616***	-3.6134**	-3.3366**
	(-5.40)	(-4.90)	(-5.62)	(-2.96)	(-2.26)	(-2.26)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	321	321	321	279	279	279
Adj. R^2	0.376	0.389	0.417	0.352	0.417	0.393

Continued on next page

Table 5.11 continued

	South Africa			Excl. South Africa		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.5811***	0.4143***	0.3616***	0.5366***	0.3483***	0.2961***
	(19.61)	(20.29)	(22.08)	(9.24)	(9.10)	(8.35)
Age	0.2112***	0.2178***	0.2008***	-0.2200*	-0.3136***	-0.2858***
	(3.71)	(5.73)	(6.20)	(-1.88)	(-3.87)	(-4.14)
Leverage	0.3599	0.5771***	0.5129***	0.2817	0.3438	0.1051
	(1.45)	(3.55)	(3.75)	(0.41)	(0.79)	(0.27)
Profitability	-0.7874***	-0.4207**	-0.4479***	-0.0276	0.3568	0.2794
	(-2.66)	(-2.04)	(-2.61)	(-0.02)	(0.30)	(0.29)
Non-zero return days	-1.4498***	-1.1957***	-1.3892***	-0.4306	-0.9939***	-1.3904***
	(-3.82)	(-4.83)	(-6.89)	(-0.85)	(-3.01)	(-4.73)
Firms in industry	-0.2439*	-0.1976*	-0.1134	-0.0992	-0.1457	-0.1472
	(-1.79)	(-1.79)	(-1.14)	(-0.59)	(-0.97)	(-1.32)
Trading Volume	0.1866***	0.0549*	0.0013	-0.0419	-0.0728	-0.1176**
	(3.73)	(1.70)	(0.04)	(-0.43)	(-1.21)	(-2.06)
Constant	-4.4169***	-3.5331***	-3.3950***	-5.5656***	-3.2134***	-2.4434***
	(-5.19)	(-5.23)	(-5.59)	(-5.55)	(-3.71)	(-3.65)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	2366	2366	2366	730	730	730
Adj. R^2	0.303	0.306	0.290	0.271	0.339	0.343

Ordered probit regressions

With averagely low levels of synchronicity, one may question the purpose of carrying out a pooled regression in the first place, given that synchronicity may not be present and that a pooled regression uses mean values for synchronicity by firm. Whilst on average R^2 figures may be low, some individual firms exhibit high levels of synchronicity, hence using a pooled regression may not necessarily be out of place. However, to address this concern, the regressions are re-run using an ordered probit model. In this context, the purpose is to test which characteristics are likely to determine synchronicity in firms. An ordered probit model is used to estimate the relationship between an independent variable and an ordinal dependent variable. Unlike a standard probit model, where the dependent variable takes on two outcomes, the dependent variable in an ordered probit model takes on more than two outcomes, which can be ordered. Synchronicity observations in each country are divided into four quartiles with categorical variables assigned to each quartile. The first quartile takes on a value of zero, the second quartile takes on a value of one, the third quartile takes on a value of 2 and the fourth quartile takes on a value of 3. Larger values of the categories therefore correspond to higher outcomes (levels of synchronicity).

The results from this estimation are presented in Table 5.12. Coefficient estimates of firm size continue to be positive and significant. Large firms have a greater probability of being more synchronous, consistent with the understanding already expressed. These firms are more likely to be more diversified and also act as act as a bellwether for general market movements, which in turn leads to higher stock return synchronicity. Coefficients for firm age are also consistent with those of previous tables. Age continues to be insignificant in all four countries except South Africa. Coefficient estimates for the other variables and the conclusions thereof are largely consistent with those from the OLS estimates. Non-zero return continues to be significant in the case of Kenya, Nigeria and South Africa, whilst the impact of leverage is statistically significant in the case of South Africa. It is however important to stress that the results in Table 5.12 only signal the impact of firm characteristics on synchronicity in terms of the direction. These are not marginal effects and therefore do not give an indication of the magnitude of change in synchronicity given a change in a particular characteristic of the firm. Overall, the results in this section support the argument that size is a key determinant of stock return synchronicity of African firms.

Table 5.12: Ordered probit regression estimates

This table presents results of Ordered probit regression estimates on the determinants of synchronicity. *Synch$_1$, Synch$_2$, and Synch$_3$* are the dependent variables. *Synch$_1$* is the R-squared from a regression of firm's stock returns on the contemporaneous market return. *Synch$_2$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return and the lagged market return. *Synch$_3$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return, lagged market return as well as the world market return. *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Age* is the log of the number of years since a firm's base date in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Profitability* is measured as Income scaled by Total Assets. *Non-Zero return days* is the number of days a firm has non-zero returns in the previous year. *Firms in industry* is the log of the number of firms in the industry to which a firm belongs. *Trading Volume* is the total trading volume of a firm in each year scaled by the number of shares outstanding at the year-end. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	Botswana			**Ghana**		
	Synch$_1$	Synch$_2$	Synch$_3$	Synch$_1$	Synch$_2$	Synch$_3$
Firm Size	0.4967***	0.2607*	0.2569*	0.5279***	0.5279***	0.3926***
	(3.18)	(1.77)	(1.75)	(4.85)	(4.85)	(4.14)
Age	-0.2203	-0.1493	-0.2833	0.1288	0.1288	0.0529
	(-0.83)	(-0.58)	(-1.09)	(0.35)	(0.35)	(0.15)
Leverage	2.2315	-0.5221	0.2016	0.0565	0.0565	0.4161
	(1.44)	(-0.35)	(0.14)	(0.07)	(0.07)	(0.55)
Profitability	0.4350	5.0014	2.2024	1.0326	1.0326	-0.0438
	(0.15)	(1.50)	(0.74)	(0.84)	(0.84)	(-0.04)
Non-zero return days	-1.8544	-1.9873	0.9476	0.4120	0.4120	1.3474
	(-0.54)	(-0.59)	(0.29)	(0.22)	(0.22)	(0.73)
Firms in industry	1.9359	6.8870**	3.7256	-1.8407	-1.8407	-0.4019
	(0.75)	(2.12)	(1.42)	(-1.11)	(-1.11)	(-0.25)
Trading Volume	0.2710**	0.0141	-0.0647	0.1588	0.1588	0.1501
	(1.97)	(0.11)	(-0.50)	(1.19)	(1.19)	(1.14)
Constant						
Cut 1	11.5278	41.3161**	22.8744	-6.5409	-6.5409	-1.9271
	(0.74)	(2.12)	(1.46)	(-1.17)	(-1.17)	(-0.36)
Cut 2	12.6058	42.1244**	23.5197	-5.1770	-5.1770	-0.7113
	(0.81)	(2.16)	(1.50)	(-0.93)	(-0.93)	(-0.13)
Cut 3	13.3372	42.8500**	24.2536	-4.0285	-4.0285	0.2452
	(0.86)	(2.20)	(1.55)	(-0.73)	(-0.73)	(0.05)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	60	60	60	86	86	86
Pseudo R^2	0.157	0.098	0.066	0.280	0.280	0.191

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Table 5.12 continued

	Kenya			Nigeria		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.2408***	0.2381***	0.2398***	0.4011***	0.4191***	0.4246***
	(4.57)	(4.48)	(4.51)	(8.44)	(8.76)	(8.85)
Age	0.1237	0.0620	0.0096	0.7823***	0.7384***	0.7875***
	(1.08)	(0.54)	(0.08)	(4.28)	(4.01)	(4.22)
Leverage	0.3670	0.6346	0.3038	-0.7076	-0.3635	-0.5356
	(0.71)	(1.21)	(0.57)	(-1.47)	(-0.76)	(-1.10)
Profitability	-0.2474	1.0216	0.6597	0.0037	0.6765	0.7066
	(-0.24)	(0.96)	(0.62)	(0.00)	(0.73)	(0.76)
Non-zero return days	1.1838***	1.3118***	1.6244***	1.9991***	2.1981***	2.2251***
	(2.87)	(3.13)	(3.82)	(5.41)	(5.78)	(5.81)
Firms in industry	-0.2799	-0.5475*	-0.2411	0.0046	-0.2831	-0.6285
	(-0.85)	(-1.67)	(-0.74)	(0.01)	(-0.31)	(-0.68)
Trading Volume	0.0041	0.0254	0.0584	0.2148***	0.2670***	0.3265***
	(0.06)	(0.38)	(0.88)	(3.00)	(3.69)	(4.31)
Constant						
Cut 1	0.8760	-0.0424	0.4005	2.0984	0.9698	-0.2525
	(0.88)	(-0.04)	(0.40)	(0.67)	(0.31)	(-0.08)
Cut 2	1.6274	0.7235	1.1599	3.0352	2.0837	0.9014
	(1.63)	(0.72)	(1.16)	(0.97)	(0.67)	(0.29)
Cut 3	2.4448**	1.5355	1.9940**	4.2116	3.2688	2.0535
	(2.43)	(1.53)	(1.99)	(1.35)	(1.05)	(0.65)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	323	323	323	291	291	291
Pseudo R^2	0.103	0.123	0.126	0.286	0.312	0.325

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Table 5.12 continued

	South Africa			Exc. South Africa		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.3331***	0.3198***	0.3189***	0.3120***	0.3301***	0.3094***
	(19.72)	(19.07)	(19.01)	(11.41)	(11.86)	(11.31)
Age	0.0956***	0.1068***	0.0747**	-0.1502***	-0.1916***	-0.2013***
	(3.00)	(3.35)	(2.36)	(-2.66)	(-3.38)	(-3.56)
Leverage	0.3997***	0.4043***	0.3800***	-0.0329	0.1365	-0.1263
	(3.21)	(3.25)	(3.07)	(-0.12)	(0.51)	(-0.47)
Profitability	-0.1435	-0.0012	-0.2210	-0.3503	0.1042	0.0853
	(-0.92)	(-0.01)	(-1.42)	(-0.72)	(0.21)	(0.17)
Non-zero return days	0.6230***	0.7561***	0.8542***	1.2479***	1.3355***	1.3241***
	(3.35)	(4.06)	(4.59)	(5.83)	(6.23)	(6.18)
Firms in industry	-0.1770	-0.4292	-0.3546	0.0346	-0.2504	-0.1333
	(-0.44)	(-1.07)	(-0.83)	(0.12)	(-0.90)	(-0.48)
Trading Volume	0.1991***	0.1924***	0.1943***	0.0685*	0.0826**	0.0647*
	(8.87)	(8.60)	(8.67)	(1.87)	(2.24)	(1.77)
Constant						
Cut 1	0.0954	-0.4386	-0.1090	0.7290	-0.0570	0.0280
	(0.09)	(-0.41)	(-0.09)	(0.85)	(-0.07)	(0.03)
Cut 2	0.9849	0.4705	0.8320	1.5609*	0.8247	0.8834
	(0.90)	(0.44)	(0.71)	(1.83)	(0.98)	(1.05)
Cut 3	2.0499*	1.5294	1.8941	2.5114***	1.8164**	1.8459**
	(1.87)	(1.42)	(1.63)	(2.93)	(2.15)	(2.19)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	2373	2373	2373	760	760	760
Pseudo R^2	0.230	0.231	0.231	0.170	0.188	0.170

The appendix to the chapter presents results of some further analysis. Specifically, Appendix 5.3 presents regression results where financial companies are excluded. The results in this appendix are qualitatively similar to results for the full sample. Hence the inclusion of financial firms does not affect the conclusions contained in this chapter. Appendix 5.4 presents OLS regression results where standard errors are clustered at the firm level. These results also remain qualitatively similar to the main results.

5.6 Conclusion

This chapter examines the level of stock return synchronicity in African markets using a sample of five countries. The analysis in the chapter is motivated by the arguments that stock prices in developing markets, which are characterised by poor protection of property rights, are deemed to be more synchronous (Morck et al 2000). One reason for this view is that arbitrageurs, who help to facilitate the incorporation of information into stock prices find poorly developed markets unattractive. Further, Jin and Myers (2006) argue that the impact of poor investor protection on stock return synchronicity is exacerbated when there is opaqueness (lack of transparency) as the lack of information inhibits investors from being able to facilitate the incorporation of information to stock prices. Thus, a high level of stock return synchronicity will imply inefficient markets. Taken this together, one may expect higher stock return synchronicity in African markets.

However, a recent school of thought, forcefully put forward by Dasgupta et al. (2010), argues that more developed markets, characterised by a better information environment, can be associated with higher stock return synchronicity. Alternatively, less developed markets, which typically have weaker information environments, can be associated with lower synchronicity. This is due to the fact that the generally low information available to market participants in less developed markets may induce a greater surprise from future company announcements leading to lower synchronicity. The increase in stock return synchronicity in a stronger information environment can be due to the continuous disclosure of both time-variant information such as earnings and time-invariant information such as managerial ability.

The findings in this chapter show that on average, stock prices in African markets do not fit the conventional narrative of high synchronicity. This is consistent with the alternative school of thought that stock return synchronicity can be high in more developed markets and low in less developed markets (Dasgupta et al. 2010). Overall, the findings in this chapter contribute to the understanding of synchronicity and how it can vary between different information environments. The results presented here underscore the need to understand the dynamics of the relationship between stock prices and synchronicity in developing and emerging markets, and how changes in a firm's information environment affect the mechanics of price discovery. The evidence provided in this chapter further shows that, unlike what pertains in developed countries, the information and economic environment in African markets may be having a different impact on the price discovery process. Thus, although these countries are characterised by low GDP and relatively weaker transparency, the averagely low level of synchronicity among firms may suggest that corporate events may carry some stock price implications. In a weak information environment, market participants may not be able to learn a lot about the fundamentals of the firms due to the lack or inadequate disclosure of information. For example, it may be difficult to determine if a particular company will be the likely target of a takeover bid. This is because, the level of transparency and disclosure may not be sufficient to enable investors or analysts gather enough information to come to this conclusion. But should such an announcement be eventually disclosed, it might trigger more substantial reactions, leading to lower levels of stock return synchronicity. The next chapter examines whether conditional on the low levels of synchronicity observed in this chapter, stock prices react to earnings announcements.

Chapter Appendices

Appendix 5.1: Ownership structure and synchronicity (using $Synch_2$ as a dependent variable)

This table presents results of OLS regression estimates of the impact of ownership structure on synchronicity. The dependent variable is $Synch_2$. To preserve space, the variable definitions are excluded from this table. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively. .

Dependent Variable: $Synch_2$

	Full Sample				Excl. South Africa			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top 5 Shareholders	0.2098				-0.1341			
	(1.24)				(-0.30)			
Institutional Ownership		0.2089				-0.5794		
		(1.23)				(-1.36)		
Government Ownership			4.6178				5.9321	
			(1.31)				(1.68)	
Families and Individuals				-0.0634				2.0566
				(-0.11)				(1.51)
Firm Size	0.5036***	0.5025***	1.3651***	0.4839***	0.6581***	0.6695***	1.4708***	0.7158***
	(17.76)	(17.72)	(5.32)	(11.13)	(10.27)	(10.33)	(5.53)	(6.54)
Age	0.1612***	0.1560**	0.8696	0.1734*	0.1239	0.1811	1.7076	-0.0057
	(2.60)	(2.51)	(0.65)	(1.92)	(0.45)	(0.66)	(1.10)	(-0.02)
Leverage	0.2506	0.2397	1.9679	0.7244**	0.6079	0.6875	1.0148	2.0976**
	(1.00)	(0.95)	(1.35)	(2.01)	(0.82)	(0.94)	(0.49)	(2.41)
Profitability	-0.0765	-0.0544	-7.0032	-0.3857	1.2163	1.4397	-5.7146	-0.8410
	(-0.21)	(-0.15)	(-0.71)	(-0.63)	(0.56)	(0.66)	(-0.27)	(-0.27)
Non-zero return days	-0.0093	-0.0244	3.9755	0.0330	1.7682*	1.7620**	4.1090	-0.1556
	(-0.03)	(-0.07)	(1.11)	(0.07)	(1.95)	(1.99)	(1.16)	(-0.16)
Firms in industry	-0.1955*	-0.1985*	-0.4959	-0.1865*	-0.0226	-0.0336	0.1079	-0.1141
	(-1.88)	(-1.91)	(-0.58)	(-1.73)	(-0.13)	(-0.19)	(0.20)	(-0.80)
Trading Volume	0.2542***	0.2493***	0.0227	0.2444***	0.1682	0.1698	-0.0839	0.2025
	(5.40)	(5.36)	(0.09)	(3.83)	(1.48)	(1.57)	(-0.26)	(1.42)
Constant	-4.8023***	-4.7325***	-15.9171***	-4.9197***	-6.2678***	-6.1567***	-21.2649***	-6.3146***
	(-7.17)	(-7.14)	(-2.79)	(-6.46)	(-4.69)	(-4.73)	(-3.06)	(-3.63)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1122	1122	54	552	235	235	44	120
Adj. R^2	0.543	0.543	0.466	0.516	0.545	0.550	0.426	0.569

Appendix 5.2 Ownership structure and Synchronicity (using $Synch_3$ as a dependent variable)

This table presents results of OLS regression estimates of the impact of ownership structure on synchronicity. The dependent variable is $Synch_3$. To preserve space, the variable definitions are excluded from this table. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

Dependent Variable: $Synch_3$

	Full Sample				Excl. South Africa			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top 5 Shareholders	0.1522				-0.2218			
	(1.07)				(-0.54)			
Institutional Ownership		0.1411				-0.4793		
		(0.95)				(-1.27)		
Government Ownership			4.0566				5.2403	
			(1.26)				(1.66)	
Families and Individuals				0.3629				1.9981
				(0.74)				(1.16)
Firm Size	0.4574***	0.4567***	1.2594***	0.4420***	0.6030***	0.6110***	1.3328***	0.6920***
	(18.16)	(18.08)	(5.33)	(11.31)	(10.53)	(10.52)	(5.95)	(7.33)
Age	0.1115**	0.1080**	0.7024	0.1284	0.0612	0.1087	1.3742	-0.0627
	(2.06)	(2.00)	(0.60)	(1.59)	(0.25)	(0.45)	(1.05)	(-0.20)
Leverage	0.2838	0.2762	1.4026	0.5901**	0.8217	0.8787	0.5405	1.4570*
	(1.41)	(1.37)	(1.05)	(1.98)	(1.49)	(1.56)	(0.29)	(1.69)
Profitability	-0.3218	-0.3060	-5.1953	-0.3426	-0.4181	-0.2886	-1.8182	-2.0361
	(-0.94)	(-0.90)	(-0.58)	(-0.62)	(-0.22)	(-0.15)	(-0.09)	(-0.71)
Non-zero return days	0.2610	0.2493	3.5467	0.4220	1.2338*	1.2111*	3.5209	-0.0407
	(0.87)	(0.83)	(1.10)	(1.06)	(1.81)	(1.83)	(1.13)	(-0.05)
Firms in industry	-0.1770*	-0.1792*	-0.4478	-0.1759*	-0.1566	-0.1590	0.1642	-0.1487
	(-1.79)	(-1.81)	(-0.59)	(-1.68)	(-0.88)	(-0.92)	(0.32)	(-1.09)
Trading Volume	0.1955***	0.1917***	0.0428	0.1887***	0.0978	0.1038	-0.0597	0.1234
	(5.24)	(5.20)	(0.18)	(3.52)	(1.12)	(1.24)	(-0.20)	(0.96)
Constant	-4.5256***	-4.4717***	-14.2188**	-4.6757***	-5.2973***	-5.2728***	-18.8109***	-5.8161***
	(-7.11)	(-7.09)	(-2.69)	(-6.39)	(-4.39)	(-4.49)	(-3.08)	(-3.62)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1122	1122	54	552	235	235	44	120
Adj. R^2	0.566	0.566	0.411	0.544	0.534	0.538	0.364	0.549

Appendix 5.3: Excluding financial companies

This table presents results of OLS regression estimates on the determinants of synchronicity, excluding Financial companies. *$Synch_1$, $Synch_2$, and $Synch_3$* are the dependent variables. *$Synch_1$* is the R-squared from a regression of firm's stock returns on the contemporaneous market return. *$Synch_2$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return and the lagged market return. *$Synch_3$* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return, lagged market return as well as the world market return. *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Age* is the log of the number of years since a firm's base date in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Profitability* is measured as Income scaled by Total Assets. *Non-Zero return days* is the number of days a firm has non-zero returns in the previous year. *Firms in industry* is the log of the number of firms in the industry to which a firm belongs. *Trading Volume* is the total trading volume of a firm in each year scaled by the number of shares outstanding at the year-end. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	Botswana			**Ghana**		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	2.1478*	0.9655	0.8851	0.4646*	0.4027***	0.1861
	(2.00)	(1.73)	(1.68)	(1.86)	(2.85)	(1.28)
Age	-1.3850	-0.8276	-0.6890	0.0000	0.0000	0.0000
	(-1.75)	(-1.16)	(-1.46)	(.)	(.)	(.)
Leverage	-7.3276	-7.8594	-5.7725	-2.8987*	-0.6079	-0.0553
	(-0.76)	(-1.27)	(-1.37)	(-2.04)	(-0.71)	(-0.08)
Profitability	1.8584	5.5006	4.4841	-3.6846	-0.0554	0.1985
	(0.21)	(1.05)	(0.96)	(-0.98)	(-0.03)	(0.14)
Non-zero return days	-13.0439	-5.3511	-2.7365	9.8699	3.3270	3.6817
	(-0.72)	(-0.41)	(-0.32)	(1.02)	(0.60)	(1.05)
Firms in industry	0.0000	0.0000	0.0000	-0.2639	0.5436	0.1320
	(0.00)	(0.00)	(0.00)	(-0.23)	(0.95)	(0.58)
Trading Volume	0.9552*	-0.0845	-0.2629	-0.7515	0.0419	-0.1272
	(1.94)	(-0.34)	(-1.18)	(-1.46)	(0.23)	(-0.75)
Constant	-9.3020*	-10.5045***	-9.9311***	-11.2918***	-8.0132***	-6.4193***
	(-1.81)	(-3.68)	(-3.95)	(-2.81)	(-3.14)	(-4.55)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	No	No	No	No	No	No
Obs	27	27	27	47	47	47
Adj. R^2	0.073	0.147	0.155	0.420	0.460	0.092

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Appendix 5.3 continued

	Kenya			Nigeria		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.3000**	0.2384***	0.2191***	0.6674***	0.4113***	0.3283***
	(2.46)	(3.12)	(3.85)	(5.67)	(5.03)	(5.93)
Age	0.2185	0.2049	0.2151	0.7545	0.4474	0.5071
	(0.68)	(0.89)	(1.14)	(0.86)	(0.73)	(0.77)
Leverage	1.6218	1.0461	0.8928	0.0930	0.6019	0.1188
	(1.12)	(1.23)	(1.42)	(0.08)	(0.80)	(0.22)
Profitability	1.7237	1.4527	1.2278	-1.3341	0.9445	0.9899
	(0.60)	(1.00)	(1.00)	(-0.59)	(0.56)	(0.95)
Non-zero return days	3.3532***	2.2446***	2.0987***	2.7147**	2.9685***	2.3735***
	(3.08)	(3.40)	(3.86)	(2.45)	(4.60)	(5.11)
Firms in industry	-0.3554*	-0.3313**	-0.2674**	0.4517*	0.4322*	0.4596**
	(-1.82)	(-2.53)	(-2.48)	(1.73)	(1.96)	(2.58)
Trading Volume	-0.1199	0.0123	0.0716	0.3545**	0.2081**	0.1470*
	(-0.49)	(0.13)	(0.86)	(2.45)	(2.01)	(1.91)
Constant	-9.2538***	-6.5252***	-6.0715***	-10.3409***	-8.9460***	-8.4143***
	(-5.44)	(-5.20)	(-6.49)	(-4.56)	(-5.17)	(-5.47)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	No	No	No	No	No	No
Obs	229	229	229	175	175	175
Adj. R^2	0.347	0.367	0.418	0.353	0.390	0.483

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Appendix 5.3 continued

	South Africa			Excl. South Africa		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.6083***	0.4474***	0.3903***	0.5609***	0.3368***	0.2827***
	(17.13)	(19.73)	(22.65)	(8.00)	(7.96)	(8.83)
Age	0.1132*	0.0997**	0.0800***	-0.2530	-0.2711***	-0.2967***
	(1.78)	(2.41)	(2.38)	(-1.60)	(-2.85)	(-3.65)
Leverage	0.8759***	0.9178***	0.820***	0.3625	0.3319	0.4941
	(2.89)	(5.02)	(5.75)	(0.50)	(0.70)	(1.60)
Profitability	-0.4940	-0.0968	-0.1164	-0.9151	0.4922	0.5849
	(-1.40)	(-0.45)	(-0.71)	(-0.65)	(0.50)	(0.86)
Non-zero return days	0.1053	0.4577*	0.374*	2.6400***	2.3227***	1.9939***
	(0.25)	(1.74)	(1.84)	(3.82)	(6.14)	(6.16)
Firms in industry	-0.0118	-0.2131*	-0.1164	-0.0617	-0.1680	-0.1562
	(-0.03)	(-1.67)	(-1.03)	(-0.36)	(-1.34)	(-1.49)
Trading Volume	0.3982***	0.2483***	0.2214***	0.0301	0.0283	-0.0299
	(7.39)	(7.75)	(7.96)	(0.25)	(0.46)	(-0.61)
Constant	-6.9353***	-4.7805***	-4.6422***	-7.7809***	-5.2271***	-4.6749***
	(-3.24)	(-6.80)	(-7.47)	(-7.17)	(-6.87)	(-7.36)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	No	No	No	No	No	No
Obs	1853	1853	1853	478	478	478
Adj. R^2	0.433	0.515	0.557	0.298	0.327	0.360

Appendix 5.4: OLS regression with clustered standard errors at the firm level

This table presents results of OLS regression estimates on the determinants of synchronicity with standard errors clustered at the firm level. *Synch₁, Synch₂, and Synch₃* are the dependent variables. *Synch₁* is the R-squared from a regression of firm's stock returns on the contemporaneous market return. *Synch₂* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return and the lagged market return. *Synch₃* is the R-Squared from the regression of a firm's stock returns on the contemporaneous market return, lagged market return as well as the world market return. *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Age* is the log of the number of years since a firm's base date in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Profitability* is measured as Income scaled by Total Assets. *Non-Zero return days* is the number of days a firm has non-zero returns in the previous year. *Firms in Industry* is the log of the number of firms in the industry to which a firm belongs. *Trading Volume* is the total trading volume of a firm in each year scaled by the number of shares outstanding at the year-end. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	Botswana			**Ghana**		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.9480***	0.6095*	0.5624*	0.9177***	0.6229***	0.4334***
	(3.46)	(2.13)	(1.97)	(4.40)	(4.70)	(3.13)
Age	-0.6834	-0.6300	-0.5775	11.8820	0.4465	-1.7142
	(-0.95)	(-1.42)	(-1.47)	(1.19)	(0.09)	(-0.33)
Leverage	2.3733	0.0861	0.4823	-0.5218	0.3261	0.8756
	(0.95)	(0.04)	(0.25)	(-0.32)	(0.35)	(0.81)
Profitability	6.6970	11.3002***	9.0903**	-2.7996	0.8611	1.0128
	(1.08)	(3.27)	(2.88)	(-1.41)	(0.81)	(0.89)
Non-zero return days	2.8032	5.1175	4.0061	4.4941	2.4048	2.2788
	(0.31)	(0.87)	(0.64)	(1.10)	(0.81)	(0.84)
Firms in industry	0.0000	0.0000	0.0000	0.0885	0.1700	0.1229
	(0.00)	(0.00)	(0.00)	(0.30)	(1.07)	(0.65)
Trading Volume	0.4137	-0.0342	-0.0356	0.0368	0.1814	0.0470
	(1.19)	(-0.16)	(-0.21)	(0.09)	(1.45)	(0.41)
Constant	-9.6997***	-9.0563***	-7.2829***	-31.6845*	-8.1241	-3.4793
	(-4.42)	(-7.15)	(-6.16)	(-1.78)	(-0.93)	(-0.37)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	60	60	60	86	86	86
Adj. R^2	0.311	0.344	0.286	0.419	0.503	0.328

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Appendix 5.4 continued

	Kenya			Nigeria		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.4828***	0.3668***	0.3208***	0.7203***	0.5199***	0.4617***
	(4.16)	(4.61)	(5.27)	(10.72)	(8.71)	(8.85)
Log(Age)	0.2422	0.0354	0.0132	0.0340	0.0297	0.1271
	(0.79)	(0.16)	(0.08)	(0.06)	(0.07)	(0.29)
Leverage	1.3004	0.6964	0.5996	-0.4594	-0.2972	-0.5563
	(0.84)	(1.10)	(1.20)	(-0.57)	(-0.47)	(-1.08)
Profitability	0.6397	0.7556	0.6961	-0.4992	-0.0421	0.0447
	(0.19)	(0.60)	(0.63)	(-0.21)	(-0.04)	(0.05)
Non-zero return days	3.0885***	2.2105***	1.9311***	3.2711***	3.0956***	2.5440***
	(3.82)	(3.41)	(3.44)	(4.71)	(6.83)	(6.44)
Firms in industry	0.0751	-0.0124	0.0219	0.2550	0.3431	0.3715*
	(0.74)	(-0.17)	(0.34)	(1.26)	(1.52)	(1.94)
Trading Volume	-0.0354	0.0628	0.1237	0.3992***	0.2728***	0.2195***
	(-0.19)	(0.52)	(1.23)	(3.36)	(3.11)	(2.89)
Constant	-10.5442***	-7.0910***	-6.2717***	-8.6522***	-8.0722***	-7.7802***
	(-8.14)	(-6.89)	(-7.25)	(-5.33)	(-5.25)	(-5.72)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Yea effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	323	323	323	291	291	291
Adj. R^2	0.423	0.421	0.466	0.541	0.581	0.653

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Appendix 5.4 continued

	South Africa			Excl. South Africa		
	$Synch_1$	$Synch_2$	$Synch_3$	$Synch_1$	$Synch_2$	$Synch_3$
Firm Size	0.5984***	0.4397***	0.3852***	0.6658***	0.4494***	0.3972***
	(15.03)	(14.87)	(15.25)	(12.26)	(10.75)	(10.16)
Log(Age)	0.1724**	0.1482***	0.1283***	-0.1595	-0.2335**	-0.2348***
	(2.33)	(2.89)	(2.87)	(-1.37)	(-2.50)	(-2.76)
Leverage	0.3456	0.4447**	0.3816**	0.4374	0.2131	0.3171
	(1.18)	(2.17)	(2.26)	(0.66)	(0.43)	(0.76)
Profitability	-0.6925**	-0.4159*	-0.4169**	-0.6993	0.1860	0.1261
	(-2.13)	(-1.88)	(-2.28)	(-0.48)	(0.23)	(0.17)
Non-zero return days	0.5667	0.8094***	0.6875***	2.4446***	2.2187***	1.8644***
	(1.27)	(2.70)	(2.79)	(4.29)	(5.17)	(4.84)
Firms in industry	-0.0196	-0.1885***	-0.1132***	0.0021	-0.1151*	-0.0903
	(-0.41)	(-5.61)	(-3.91)	(0.03)	(-1.75)	(-1.60)
Trading Volume	0.3391***	0.2137***	0.1781***	0.1353	0.0848	0.0439
	(5.81)	(5.69)	(5.69)	(1.39)	(1.29)	(0.77)
Constant	-7.2533***	-5.0487***	-4.8664***	-8.3965***	-5.7900***	-5.2809***
	(-18.91)	(-19.78)	(-22.58)	(-12.90)	(-11.43)	(-11.53)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Yea effect	Yes	Yes	Yes	Yes	Yes	Yes
Obs	2373	2373	2373	760	760	760
Adj. R^2	0.448	0.520	0.547	0.414	0.435	0.461

Chapter 6

Earnings Informativeness: Fundamentals or Trading Frequency?

6.1 Introduction

It has been established in the previous chapter that contrary to expectations based on previous studies (Morck et al. 2000, Jin and Myers 2006), stock returns in African markets (which are largely developing markets) is low on average. What then does this imply for stock pricing in these markets? Do African markets respond to corporate information as the low level of synchronicity might suggest? If so, and given this low level of synchronicity on average, are market reactions to corporate information driven by trading frequency and/or fundamentals of the firm? Arguably the most important channel of communication of company performance between managers and shareholders and, by implication, investor protection is the annual earnings announcement. This chapter addresses the above issues using a sample of annual earnings announcements.

This chapter is also motivated by the low attention given to semi-strong efficiency in studies of market efficiency in African markets, compared to weak form efficiency (eg. Appiah-Kusi and Menyah 2003, Jefferis and Smith 2005, Lagoarde-Segot and Lucey 2008). As African markets develop, it is important to extend the analysis into the informativeness of new publicly available information. To date, there have been relatively few studies of semi-strong form efficiency of African stock markets. This lack of evidence has largely been due to data limitations and general illiquidity of most African stock markets (Assefa and Mollick 2014). Another important factor has been the poor quality of data provided by corporate news providers in Africa. Griffin et al. (2011) show that earnings and other corporate news announcements are more informative in countries with greater media sophistication and technology. The few studies that have examined the stock price reaction to corporate announcements by African companies such as earnings find little evidence to support the view that news regarding African firms carries information content (Osei 2002, Afego 2013). Consistent with the data constraints, samples used in these studies have been small. However, in recent years, many African stock markets have taken steps to improve the provision of value relevant corporate information. For example, many stock markets in Africa now have electronic trading systems that enable investors and other market participants to obtain information on a real-time basis. The websites of African stock exchanges also contain sections for company announcements, many of which qualify as price sensitive under the current regulation. Thus, this chapter also examines the extent to which recent development of

African markets has affected information efficiency and the desirability of African markets as an investment prospect.

To investigate the informativeness of earnings announcements, this chapter uses a large set of corporate annual earnings announcements from companies in three out of the five countries used in the previous chapter - Kenya, Nigeria and South Africa.[9] It then examines whether market reactions are associated with firm fundamentals (earnings characteristics) or trading frequency. In order to capture informativeness of earnings, normalised volatility (based on market-adjusted abnormal returns) is computed. This compares volatility during the earnings event window to volatility for a period outside the earnings announcement window (Griffin et al. 2011). Abnormal trading volume for the same event window as normalized volatility is also computed.

The results show that earnings announcements are informative in all three countries but the impact of characteristics of earnings varies by country. Informativeness of earnings is strongly influenced by the level of trading frequency. The magnitude of earnings affects trading volume but not price in the Kenyan sample whilst both price and trading volume is affected by the size of earnings in Nigeria. Price and trading volume are associated with changes in earnings and changes from negative to positive earnings respectively in the South African sample. There is also some evidence of the impact of trading frequency. Notably, less frequently traded stocks are associated with greater earnings informativeness. More highly traded stocks are less associated with earnings informativeness which may indicate, higher levels of synchronicity, consistent with the findings in the previous chapter.

Overall, this chapter provides some new evidence on how African markets respond to new value-relevant information. Evidence is found to suggest that highly traded stocks are less responsive to new earnings information which provides circumstantial support for the argument that company earnings are less important than market movements in pricing African stocks. This chapter also contributes to the broader literature on market efficiency and investor protection in developing countries. Financial development may follow from strong investor protection and market efficiency is of paramount importance as a mechanism for investor protection in developing markets. Markets, developing or otherwise, will only attract investment funds if investors believe that market values reflect the value of companies and if the market is sufficiently liquid to ensure shareholders can

[9] An explanation for using three out the five countries has already been provided on Chapter 4

sell their stocks cheaply and quickly. The responsiveness of markets to earnings information provides evidence of an efficient market. This is in a sense that investors and market participants act to update prices of stocks to reflect new information. The results suggest that whilst earnings are informative across the sample, work is needed to improve investor protection in the African markets.

The rest of the chapter is organised as follows: Section 6.2 develops the hypothesis to be tested. Section 6.3 presents the empirical design. Section 6.4 presents the empirical results which include summary statistics and correlations as well as univariate and multivariate analysis of earnings informativeness. Robustness checks are presented in Section 6.5. Section 6.6 concludes the chapter.

6.2 Hypothesis development

Are earnings informative in African markets?

Although there is a large literature on market responses to earnings announcements, evidence on earnings informativeness in an international context is in its infancy (Landsman et al. 2012). Due to structural changes such as financial development and changes to accounting rules and enforcement, research on the role of earnings in emerging markets remains topical. Effective structures in developed countries facilitate the price discovery process, enhancing market efficiency in these markets through frequent trading. However, according to Griffin et al. (2010), when the information environment is saturated, investors may not be able to process all information efficiently leading to under-reaction to earnings and related announcements. On the other hand, there may be little or no reaction at all to earnings announcements in developing countries which have considerably weaker information environments. Again, Griffin et al. (2010) recognise that this might be, at least partly, attributed to higher transaction costs. Such structural factors also bother on synchronicity and illiquidity as identified by Bhattacharya et al. (2000) who argue that stock prices in less developed countries may not react to corporate reasons because: 1) the stock market in question is generally informationally inefficient; (2) firms in the market do not make value-relevant announcements; (3) the news announced may have been completely anticipated; or (4) insider trading prohibitions may be non-existent or not enforced. Morck et al (2000) again argue that in countries with poorer protection of investor and property rights, makes firm level information less useful to traders which reduces the incorporation of such firm information into stock prices. However, and as noted in Chapter 2, given that most African stock markets have made

improvements their stock market operations including the introduction of electronic trading platforms and given the low level of stock return synchronicity observed in Chapter 5, this chapter hypothesises that earnings announcements in African markets would have some information content.

H8: Earnings announcements in African markets are informative.

Is earnings informativeness influenced by trading frequency?

The liquidity of stocks plays an important role in the general determination of asset prices and stock returns (Bekaert et al. 2007). The importance of liquidity in influencing stock returns dates back to the work of Amihud and Mendelson (1986), who argue that, expected returns of stocks are an increasing concave function of liquidity. Amihud (2002) also finds that expected returns increase with illiquidity. The implications of liquidity for stock returns may therefore be extended to the informativeness of corporate information which measures how stock returns are affected by such corporate information (eg. earnings announcements). As already mentioned in Chapter 2 of this thesis, one of the major characteristics of African markets is the low level of trading, manifested in the high incidence of zero returns. Given that stock return synchronicity has been found to be low, it is necessary to examine whether the nature and frequency of trading plays a role in the reaction of stock returns to corporate information, which in this case is the earnings report. For the purpose of this chapter, liquidity is captured by trading frequency. Trading frequency is measured based on the percentage of non-zero returns in the previous year of trading. As already mentioned in Chapter 4, Hearn and Piesse (2013) provide evidence that the percentage of non-zero return days more accurately captures liquidity in a sample of African countries which include all the countries used in this study.

H9: Earnings informativeness in African markets is influenced by trading frequency

Do fundamentals (earnings characteristics) affect earnings informativeness?

The next four set of hypotheses test how earnings informativeness could be influenced by the fundamentals of the firm, which in this context, refers to the characteristics of the firm's earnings. These include the magnitude of earnings, changes in the earnings relative to the previous year and changes from negative to positive earnings and vice versa. The early work of Beaver (1968) shows earnings as an important component of the valuation of a firm's common stock. This is especially true as the value of common stock is determined by future cash flows which primarily come from earnings. But as he observes,

central to this relationship between earnings and stock returns is the fact that earnings should have information content. Thus, in any framework for determining the informativeness of earnings, the relative magnitude of earnings could influence the market reactions associated with the release of earnings information. Further, and based on the idea of loss aversion, it is normal to expect higher reactions to earnings when there are losses rather than gains as individuals have a greater aversion for the former than the latter (Pinello 2008). However studies such as Bartov, Givolvy & Hayn (2002) and Kasnik & McNichols (2002) find asymmetrically stronger reactions to positive earnings surprises than negative. This chapter focuses on the changes that involve a switch from negative earnings to positive earnings and positive earnings to negative earnings to capture asymmetric reactions to earnings surprises with greater market reactions to positive news.[10] For African markets that are generally characterised by weak information flow, the nature and characteristics of earnings reported would be important in determining how investors and other market participants react to earnings announcements.

10a: Market reactions to earnings announcements are positively associated with the magnitude of announced earnings.
10b: Market reactions to earnings announcements are positively associated with positive changes in earnings relative to the previous year.
10c: Market reactions to earnings announcements are positively related to changes in earnings from negative to positive.
10d: Market reactions to earnings announcements are negatively associated with changes in earnings from positive to negative.

6.3 Empirical design

Abnormal returns to earnings announcements are computed using the market adjusted model as already indicated in Chapter 4. However, as the main aim is to examine the information content or lack thereof of earnings announcements, the absolute value of the market-adjusted abnormal returns is used as a measure of volatility around the earnings announcement. Consistent with Griffin et al. (2011), normalised volatility (*NormalisedVol*) is used to measure whether volatility within the event window is greater than volatility during normal periods (a period outside the event window). This therefore provides a more intuitively appealing way to detect information content. If volatility is found to be greater in the event window than during normal periods, earnings are deemed

[10] The lack of forecast data limits the ability to predict earnings surprises. Hence the chapter uses changes in the sign of earnings to indicate unexpected information.

to have information content. The period outside of the event window includes a period prior to the beginning of the event window and a period after the end of the event window. Given that trading and news transmission mechanisms are still not sophisticated in most African markets, a slightly bigger event window (-10, +10) is applied as compared to those used in more developed markets. However, normalised volatility is also presented for other event windows. The pre- and post-event windows are each made up of 60 days.

Normalised volatility is therefore computed as:

$$Normalised\ Vol = \left(\frac{Event\ Vol}{Normal\ Vol}\right) - 1 \qquad 6.1$$

Where

$$Event\ Vol = \frac{1}{N}\sum_{i=1}^{N}\frac{1}{21}\sum_{t=-10}^{10}|AR_{it}| \qquad 6.2$$

$$Normal\ Vol = \frac{1}{N}\sum_{i-1}^{N}\frac{1}{120}\left(\sum_{t=-11}^{-70}|AR_{it}| + \sum_{t=11}^{70}|AR_{it}|\right) \qquad 6.3$$

In multivariate analyses, the impact of earnings characteristics on abnormal returns is determined by estimating the following model for firms in each country.

$$\begin{aligned}\mathrm{CAR_{it}} = {} & \text{Earnings Characteristics}_{\mathrm{it}} + \text{Firm Size}_{\mathrm{it}} + \mathrm{Age_{it}} + \mathrm{Leverage_{it}} \\ & + \text{Trading Frequency}_{\mathrm{it}} + \mathrm{Synchronicity_{it}} + \text{Reporting Lag}_{\mathrm{it}} \\ & + \text{Industry} + \text{Year} + \varepsilon_{\mathrm{it}}\end{aligned} \qquad 6.4$$

Where for a sample firm i: *CAR* is the cumulative abnormal returns to earnings at year t. Earnings Characteristics include; *Earnings, Earnings Growth, Positive to Negative and Negative to Positive*. *Earnings* is computed as Earnings in year t scaled by total assets. *Earnings Growth* is the change in Earnings to total assets. *Negative to Positive* is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. *Positive to Negative* is an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise. *Firm Size* is the size of the firm at year t measured as the natural log of the firm's market value at the beginning of the year. *Age* is the log of the number of years since the based date of the firm in Datastream. *Leverage* is firm leverage computed as total debt divided by total assets at the beginning of the year.

Trading Frequency is an indicator variable that takes the value of 1 if the firm is in the ≥75% (*HTF*) category and 0 if in the 50%-74% (*MTF*) category. *Synchronicity* is the R^2 obtained from a regression of the daily returns of individual stock returns in each year against the returns on the market for the corresponding period. *Reporting Lag* is the number of days between the fiscal year end of the firm and the earnings announcement date.

As indicated earlier, revisions of investors' expectations resulting from the arrival of new corporate information would be expected to lead to increased trading volume. Hence, in addition to normalised volatility, the informativeness of earnings as measured by abnormal trading volume (*ATV*) around the earnings announcement is also examined (Pevzner et al. 2015, DeFond et al. 2007, Landsman et al. 2012). Abnormal trading volume is computed as:

$$ATV = \left(\frac{Trading\ Volume_{(-10,10)}}{Trading\ Volume_{(-70,-11)}}\right) \qquad 6.5$$

Trading volume is scaled by number of shares outstanding.
Again, in multivariate analysis, the impact of earnings characteristics on abnormal trading volume is determined by estimating the following equation:

$$\begin{aligned} \mathrm{ATV_{it}} = {} & \text{Earnings Characteristics}_{\mathrm{it}} + \text{Firm Size}_{\mathrm{it}} + \text{Age}_{\mathrm{it}} + \text{Leverage}_{\mathrm{it}} \\ & + \text{Trading Frequency}_{\mathrm{it}} + \text{Synchronicity}_{\mathrm{it}} + \text{Reporting Lag}_{\mathrm{it}} \\ & + \text{Industry} + \text{Year} + \varepsilon_{\mathrm{it}} \end{aligned} \qquad 6.6$$

where *ATV* is the abnormal trading volume which is estimated as the average trading volume of the stock during the event window scaled by the average trading volume over a 2 month (60 days) period prior to the event window. This is considered to be a sufficient period to reflect normal trading activity prior to the event window. All other variables are as defined in equation 4.

6.4 Empirical results

This section of the chapter presents and discusses the results.

6.4.1 Descriptive statistics and correlations

Table 6.1 shows the summary statistics for variables in the sample by country. The mean *NormalisedVol* is 0.12, 0.10 and 0.02 for Kenya, Nigeria, and South Africa respectively. These figures are lower than the mean figure reported in Griffin et al (2011) for emerging countries (0.15). However, this is understandable as their study included countries that are relatively more developed than the countries in our sample. The only African country included in their study was South Africa. The mean (median) cumulative abnormal return (*CAR*) is -0.008 (-0.024) for Kenya, -0.02(-0.03) for Nigeria and -0.008(-0.009) for South Africa. The mean (median) abnormal trading volume (ATV) is 1.373(1.144), 1.240(0.970) and 1.258(1.069) for Kenya, Nigeria, and South Africa respectively. Firms in Kenya and Nigeria appear on average to have the same level of earnings with South Africa having a slightly higher level. Earnings changes from positive in the previous year to negative in the current year are 6.8% for Kenya, 5.5% for Nigeria and 6.6% for South Africa whilst earnings change from negative to positive are 4.1%, 11.6%, and 5.6% respectively. Firms in all three countries are relatively smaller in size (less than half the size) compared to those in Pevzner et al. (2015) who include both developed and emerging market firms (including US and UK firms). Mean leverage is less than 20% in all countries indicating that sample firms use relatively low levels of debt in the capital structure. The mean synchronicity values are 5.4%, 12%, and 10.5% respectively for Kenya, Nigeria and South Africa. Additionally, on average, firms take 90 days 117 days and 66 days after their fiscal year end to report their earnings in Kenya, Nigeria, and South Africa respectively. It is interesting but encouraging to observe that the mean figure for Reporting Lag is below the maximum time given for firms in each of these three countries to report their earnings. But a closer look at the maximum figure shows that some firms in each of these countries take substantially longer to report their earnings. However, these firms are only small in number and their inclusion does not affect the results of the empirical analysis.

Table 6.1: Summary statistics

This table presents summary statistics of variables used. It reports the number of observations, mean, standard deviation, minimum value, median value and maximum values. In order to minimise the effects of outliers, continuous variables are winsorised at the 1st and 99th percentile. For variables that are log transformed, the non-log transformed version is reported in this table.

Panel A: Kenya

	Count	Mean	SD	Min	Median	Max
Normalised Vol	241	0.120	0.339	-0.581	0.078	0.939
CAR	241	-0.008	0.119	-0.383	-0.024	0.363
ATV	235	1.373	0.989	0.166	1.144	5.381
Earnings	236	0.057	0.063	-0.294	0.046	0.235
Earnings Growth	221	-0.005	0.056	-0.290	0.000	0.321
Positive to Negative	222	0.068	0.252	0.000	0.000	1.000
Negative to Positive	222	0.041	0.198	0.000	0.000	1.000
Firm Size ($million)	241	292.108	463.553	1.550	118.350	3318.080
Age	241	15.456	6.274	2.000	17.000	24.000
Leverage	210	0.170	0.153	0.001	0.130	0.628
Trading Frequency	241	0.079	0.270	0.000	0.000	1.000
Synchronicity	241	0.054	0.088	0.000	0.015	0.470
Reporting Lag	232	89.759	38.157	37.000	80.500	246.000

Panel B: Nigeria

	Count	Mean	SD	Min	Median	Max
Normalised Vol	218	0.095	0.316	-0.581	0.070	0.939
CAR	218	-0.022	0.128	-0.383	-0.033	0.363
ATV	210	1.240	0.936	0.166	0.970	5.381
Earnings	215	0.059	0.071	-0.130	0.040	0.314
Earnings Growth	198	0.013	0.091	-0.210	0.000	0.838
Positive to Negative	199	0.055	0.229	0.000	0.000	1.000
Negative to Positive	199	0.116	0.321	0.000	0.000	1.000
Firm Size ($million)	161	838.750	1415.487	4.790	267.620	8364.220
Age	185	3.541	1.925	0.000	3.000	11.000
Leverage	176	0.154	0.136	0.001	0.112	0.691
Trading Frequency	218	0.165	0.372	0.000	0.000	1.000
Synchronicity	218	0.120	0.138	0.000	0.068	0.750
Reporting Lag	211	116.711	56.413	28.000	101.000	246.000

Panel C: South Africa

	Count	Mean	SD	Min	Median	Max
Normalised Vol	1303	0.015	0.283	-0.581	-0.013	0.939
CAR	1303	-0.008	0.122	-0.383	-0.009	0.363
ATV	1247	1.258	0.824	0.166	1.069	5.381
Earnings	1296	0.076	0.250	-5.380	0.074	4.731
Earnings Growth	1280	-0.002	0.147	-1.013	-0.001	0.917
Positive to Negative	1281	0.066	0.248	0.000	0.000	1.000
Negative to Positive	1281	0.056	0.230	0.000	0.000	1.000
Firm Size ($million)	1303	1426.835	2216.046	3.190	420.760	8364.220
Age	1303	14.467	8.650	1.000	14.000	42.000
Leverage	1206	0.191	0.175	0.001	0.152	1.172
Trading Frequency	1303	0.102	0.303	0.000	0.000	1.000
Synchronicity	1303	0.105	0.134	0.000	0.044	0.610
Reporting Lag	1289	66.247	20.761	28.000	64.000	236.000

Table 6.2: Correlations

This table presents correlations between variables used. Continuous variables are winsorised at the 1st and 99th percentile. ***,** and * denote statistical significance at the 1%, 5% and 10% levels respectively

Panel A: Kenya

		1	2	3	4	5	6	7	8	9	10	11	12
1	Normalised Vol												
2	CAR	0.180***											
3	ATV	0.192***	0.230***										
4	Earnings	0.0323	0.138**	0.0336									
5	Earnings Growth	-0.016	0.107	0.137**	0.485***								
6	Positive to Negative	0.0322	-0.248***	0.0485	-0.452***	-0.443***							
7	Negative to Positive	-0.140**	-0.00743	0.108	-0.0482	0.408***	-0.0553						
8	Firm Size	-0.109*	-0.0599	-0.104	0.167**	0.0332	-0.134**	-0.1					
9	Age	-0.0176	0.00721	0.0364	-0.0207	0.117*	-0.0441	0.0721	-0.222***				
10	Leverage	0.0449	-0.203***	0.0794	-0.226***	-0.0982	0.297***	0.0851	-0.185***	-0.0124			
11	Trading Frequency	-0.00773	-0.133**	0.000468	-0.0564	-0.0556	-0.0142	0.106	-0.0362	-0.0548	0.0185		
12	Synchronicity	-0.0902	0.0403	-0.0805	0.0524	-0.0000493	-0.0982	-0.103	0.618***	-0.208***	-0.203***	-0.00166	
13	Reporting Lag	-0.0977	-0.0857	0.0574	-0.218***	-0.0378	0.0664	0.186***	-0.355***	0.0294	0.0593	-0.0522	-0.295***

Continued on next page

Table 6.2 continued

Panel B: Nigeria

		1	2	3	4	5	6	7	8	9	10	11	12
1	Normalised Vol												
2	CAR	0.0314											
3	ATV	0.0027	0.114*										
4	Earnings	-0.0528	0.151**	0.055									
5	Earnings Growth	0.145**	-0.0507	-0.170**	0.153**								
6	Positive to Negative	-0.09	-0.00189	0.0953	-0.331***	-0.244***							
7	Negative to Positive	0.0736	-0.112	-0.0682	-0.128*	0.530***	-0.0874						
8	Firm Size	0.0316	0.02	0.101	0.184**	-0.0741	-0.113	-0.158*					
9	Age	0.124*	0.0353	-0.00971	-0.05	0.0293	0.00696	-0.106	0.167**				
10	Leverage	0.0315	-0.0358	-0.0769	-0.267***	0.151*	0.103	0.106	-0.229***	0.0393			
11	Trading Frequency	-0.0905	0.026	-0.0763	-0.140**	0.206***	0.129*	0.177**	-0.191**	0.00204	0.154**		
12	Synchronicity	0.139**	-0.0173	0.0604	-0.0665	-0.0745	-0.104	-0.122*	0.756***	0.182**	-0.246***	-0.0982	
13	Reporting Lag	0.00275	-0.0129	-0.0461	-0.220***	-0.200***	0.303***	-0.0647	-0.357***	-0.0371	0.0676	0.187***	-0.293***

Panel C: South Africa

		1	2	3	4	5	6	7	8	9	10	11	12
1	Normalised Vol												
2	CAR	0.0912***											
3	ATV	0.0286	0.000376										
4	Earnings	0.0234	0.0412	0.0292									
5	Earnings Growth	-0.0129	0.0257	0.0168	0.484***								
6	Positive to Negative	0.0113	0.0331	-0.00348	-0.197***	-0.296***							
7	Negative to Positive	0.00214	0.0511*	0.0591**	-0.0000743	0.366***	-0.0646**	1					
8	Firm Size	-0.0168	0.0112	-0.0850***	0.0637**	0.00293	-0.0772***	-0.0835***					
9	Age	0.0345	0.0346	-0.0314	0.0155	0.0105	0.0362	0.00758	0.294***				
10	Leverage	0.0285	0.0181	-0.0511*	-0.114***	-0.0667**	0.104***	0.00175	-0.0401	0.00965			
11	Trading Frequency	-0.00492	-0.0472*	-0.0208	-0.0379	-0.0318	0.0339	-0.00528	0.270***	0.106***	-0.0499*		
12	Synchronicity	0.00815	0.017	-0.0958***	0.0640**	0.0167	-0.114***	-0.0697**	0.812***	0.287***	-0.0446	0.328***	
13	Reporting Lag	0.0000331	-0.0419	0.0201	-0.0554**	-0.0025	0.0643**	0.00292	-0.214***	-0.179***	-0.0245	-0.0705**	-0.234***

Table 6.2 presents bivariate correlations between variables. Modest correlation is displayed between *Firm Size* and a number of variables, the highest of these being with the *Reporting Lag* which is also correlated with a number of other variables. *Reporting lag* is related to the complexity of accounting as the company gets larger. Small but significant correlations are identified for *Leverage* with earnings and structural variables but notably not with *Firm Size.*

6.4.2 Informativeness of earnings announcements

Table 6.3 shows normalised volatility (*NormalisedVol*) calculated for the main event window and a set of other event windows. Panel A presents *NormalisedVol* for all earnings announcements by country. Panels B and C show *NormalisedVol* for positive and negative *CAR*s respectively. Positive *CAR*s signify good news and negative *CAR*s indicate bad news. In panel A, for the main event window, normalized volatility is 0.12 for the full sample of Kenyan earnings announcements, implying that volatility during the event window is 12% greater than volatility during normal periods. Normalised volatility is 9.5% and 2% for Nigeria and South Africa respectively for their full samples. The implication is that earnings announcements carry information content as volatility during the event window is significantly greater than volatility during normal periods. Using a smaller event window, (-1, +1), normalised volatility remains positive and significant for both Kenya and Nigeria but is not significant for South African companies. Similar observations are made on the event day itself. These findings provide support for Hypothesis 8 which seeks to suggest that earnings in African markets are informative.

Normalised volatility across all event windows except the pre-event window in (-10, -3) in the case of Kenya and Nigeria and (-2 +2 and -1, +0) for South Africa, are positive. In essence, a positive normalised volatility figure implies that volatility in the event window is greater than volatility in the period outside of the event window. In the light of the low level of stock return synchronicity established in the previous chapter, and some of the gradual improvements in African markets over the period, these results are not surprising. What appears a bit surprising is the lack of evidence of leakage especially for Kenya and Nigeria. As can be seen from the table, Normalised volatility for the full sample for (-10, -3) in both countries, is negative suggesting lack of informativeness, whilst that for the South African sample, for the same event window, is positive. A potential explanation may be that, since both Kenya and South Africa are relatively underdeveloped as compared to South Africa, there may be less interest by

market participants in being keen to know more about the earnings, and possibly other corporate information, ahead of when they are released.

Normalised volatility for both HTF and MTF categories for the full sample of earnings announcement in Panel A, also shows some evidence of information content. Again, except for the pre-event window, both HTF and MTF categories across all event widows show positive values for Kenya and Nigeria. South Africa, on the other hand, has more negative values for normalised volatility for the HTF sample but less only one negative value for the (-1, +0) event window in the MTF category. One observation that can be clearly made for the HTF and MTF sub-samples is that, in terms of statistical significance, earnings announcements in the MTF category are informative than earnings in the MTF category. Thus, earnings informativeness is influenced by trading frequency, providing support for Hypothesis 9. Announcements in the *MTF* category display higher and more significant *NormalisedVol* than announcements in the *HTF* category in all panels of Table 6.3. The results from the *MTF* sample indicate significant informativeness of earnings for less frequently traded stocks in Kenya and Nigeria whilst informativeness seems confined to good news in South Africa. The latter result is consistent with a behavioral explanation. Significance in the *HTF* sample is associated with the post-announcement window (+3, +10) in all three countries and with Kenyan firms in other windows.

One explanation for this phenomenon may be that stocks that trade less frequently are more greatly impacted by news that is material to stock prices in these countries. The evidence presented in Table 6.3 suggests that although stocks in these African markets are generally illiquid, for stocks that meet a certain threshold of trading frequency, the more highly frequently traded stocks from that category by their nature of being frequently traded, may react less to the corporate information whilst the relatively less frequently traded stocks, who still meet the minimum threshold react more profoundly to earnings announcements. Also, stocks in the more highly traded (HTF) category may be more synchronously traded and are therefore more susceptible to market movements. In deed this is consistent with the findings in the previous chapter, where the percentage of non-zero return days has a significant and positive impact on stock return synchronicity in Kenya, Nigeria and South Africa.

Table 6.3: Normalised volatility for different earnings event window

This table presents earnings event reaction results in the form of normalized volatility. Normalised volatility measures the volatility of stock returns with the event window in relation to volatility outside the event window, and is computed as ((event volatility/normal volatility)-1). Event volatility is computed as the mean absolute market-adjusted abnormal return within the event window. For an -10,+10 event window, event volatility is computed as $EventVol = \frac{1}{N}\sum_{i=1}^{N}\frac{1}{21}\sum_{t=-10}^{10}|AR_{i,t}|$. Normal volatility is computed as mean absolute market-adjusted abnormal return for the 60 days before the start of the event window and 60 days after the end of the event window. For a -10, 10 event window, normal volatility is computed as $NormalVol = \frac{1}{N}\sum_{i=1}^{n}\frac{1}{120}\left(\sum_{t=-11}^{-70}|AR_{i,t}| + \sum_{t=11}^{70}|AR_{i,t}|\right)$. Panel A presents results for all earnings, Panel B for positive earnings and Panel C for negative earnings. ***, ** and * denote statistical significance at the 1% , 5% and 10% respectively. Significance only reported for EventVol>NormalVol.

PANEL A: ALL EARNINGS

	Full			HTF			MTF		
Event Window	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
(-10,+10)	0.122***	0.095***	0.022**	0.111**	0.03	0.01	0.123***	0.108***	0.023**
(-10,-3)	-0.016	-0.013	0.029*	-0.117	-0.058	0.005	-0.007	-0.004	0.032*
(-2,+2)	0.375***	0.139***	-0.001	0.433**	0.08	-0.017	0.370***	0.151***	0.001
(-1,+1)	0.507***	0.187***	0.016	0.667**	0.107	-0.039	0.494***	0.203***	0.022
(-1,0)	0.336***	0.164***	-0.011	0.281	0.136	-0.038	0.341***	0.169***	-0.007
0	0.496***	0.324***	0.024	0.777*	0.069	0.034	0.472***	0.374***	0.023
(0,+1)	0.665***	0.279***	0.046**	1.111**	0.06	-0.004	0.626***	0.323***	0.052**
(0,+3)	0.438***	0.202***	0.015	0.599**	0.024	0.007	0.424***	0.237***	0.016
(+3,+10)	0.111***	0.185***	0.055***	0.163**	0.161**	0.073**	0.107***	0.189***	0.053***

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Table 6.3 continued

PANEL B: POSITIVE CARs

	Full			HTF			MTF		
Event Window	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
(-10,10)	0.216***	0.114***	0.052***	0.199*	-0.034	0.008	0.216***	0.145***	0.056***
(-10, -3)	0.013***	-0.044	0.078***	-0.314	-0.271	0.003	0.038	0.005	0.086***
(-2,2)	0.389***	0.124**	0.048**	0.293	0.027	0.023	0.394***	0.144**	0.051**
(-1,1)	0.537***	0.085	0.076***	0.132	0.063	0.039	0.573***	0.09	0.079***
(-1,0)	0.390***	0.12	0.029	-0.057	0.145	-0.073	0.437***	0.114	0.041
0	0.505***	0.217**	0.111**	0.301	0.186	0.014	0.529***	0.225*	0.122***
(0,1)	0.652***	0.171**	0.103***	0.622	0.062	0.088	0.655***	0.192**	0.104***
(0-3)	0.455***	0.151**	0.050**	0.396	-0.009	0.032	0.460***	0.178**	0.052**
(3,10)	0.158***	0.128***	0.064***	0.238	0.052	0.078	0.152***	0.145***	0.063***

PANEL C: NEGATIVE CARs

	Full			HTF			MTF		
Event Window	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
(-10,10)	0.059**	0.082***	-0.004	0.088	0.076	0.012	0.055*	0.083***	-0.006
(-10, -3)	-0.041	0.007	-0.016	0.026	0.095	0.007	-0.047	-0.01	-0.019
(-2,2)	0.362***	0.152***	-0.045	0.497**	0.128	-0.047	0.346***	0.157***	-0.045
(-1,1)	0.482***	0.295***	-0.041	1.149**	0.17	-0.091	0.426***	0.316***	-0.034
(-1,0)	0.288***	0.212***	-0.049	0.746*	0.121	0.001	0.256***	0.226**	-0.055
0	0.490***	0.438***	-0.053	1.307	-0.094	0.052	0.436***	0.527***	-0.064
(0,1)	0.674***	0.384***	-0.009	1.656**	0.058	0.088	0.605***	0.447***	0.000
(0-3)	0.424***	0.249***	-0.014	0.747**	0.048	-0.01	0.396***	0.294***	-0.015
(3,10)	0.076**	0.236***	0.048***	0.107	0.283***	0.068	0.073**	0.228***	0.046***

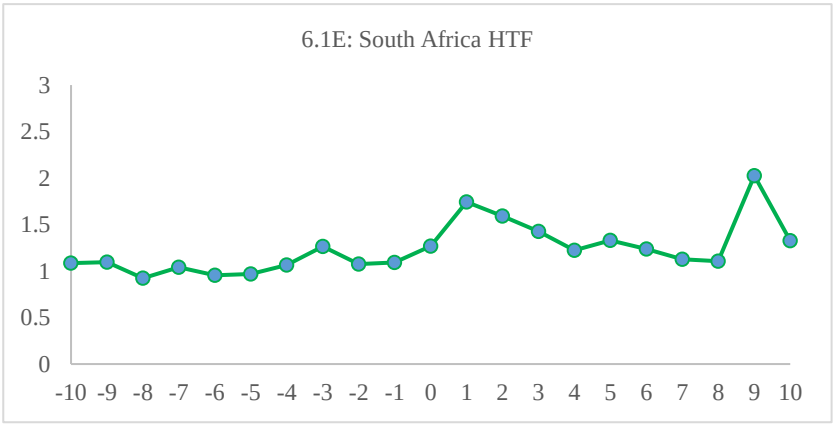
Asymmetric reactions to good and bad earnings information are examined in panels B and C of Table 6.3. Positive *CAR*s are considered to indicate good news and negative *CAR*s indicate bad news. For the full event window, results are largely consistent, if a little lower in magnitude for negative news, with those in Panel A for Kenya and Nigeria. Notably, for the South African sample, good news appears to result in higher returns throughout our event window but normalized volatility is only positive and significant in the post-event window (+3, +10) for bad news. In the period prior to the event (-10,-3), only positive and significant normalized volatility is observed in Panel B and not in Panel C. This might suggest that firms are more likely to leak information when earnings news is good.

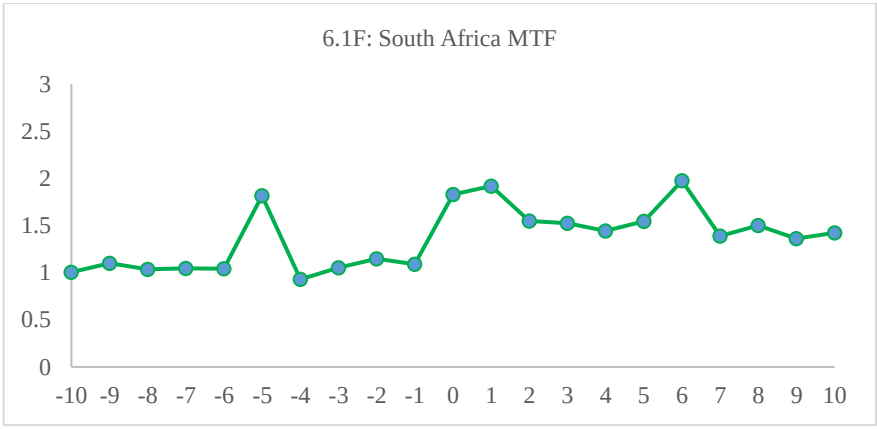
It is also important to mention that informativeness of earnings announcements, captured by normalised volatility as presented in Table 6.3, may also be explained with respect to some of the institutional and development characteristics of these markets in general, and their stock markets in particular. Firstly, and as can be observed from Table 2.1 in Chapter 2, firms are required to report their earnings in 4 months, 90 days and 6 months after their financial year in Kenya, Nigeria and South Africa, respectively. However, the mean reporting lag shown in Table 6.1 of this chapter reveals that on average firms take a less number of days to report their earnings in these countries. This may contribute to making earnings announcements more useful and timely. Secondly, there is also now the presence of automated trading systems in markets used for this study as shown in Table 2.2 of Chapter 2. All else equal, this enhances the flow and access of information and helps in the price discovery process with respect to such regulatory news items as earnings announcements.

Figure 6.1 shows the average abnormal trading volume over the event window. As earlier indicated, abnormal trading volume is the trading volume over the event window divided by trading volume in a period of 60 days prior to the event window. In all instances, trading volume for each day is scaled by the number of shares outstanding. Overall, there appears to some abnormal trading activity in the event window. In the case of Kenya and Nigeria, this appears more profound for the HTF category whilst for South Africa, this appears so for the MTF category.

Figure 6.1 Average abnormal trading volume during full event window.

Figure 6.1 continued





6.4.3 Analyses of earnings informativeness and fundamentals

Regression analyses of abnormal returns (CARs)

This section of the chapter presents the analyses of how the market reactions to earnings are affected by the fundamentals of the firm, i.e earnings characteristics. The dependent variables that are used are *CARs* and *ATV*. Results of the regression analysis of *CAR*s are presented in Table 6.4, and those of *ATV* are presented in Table 6.5. The earnings characteristics of interest are: the magnitude of earnings (*Earnings*), the change in the magnitude of earnings (*Earnings Growth*) and changes in earnings negative to positive and vice versa (*Negative to Positive/Positive to Negative*). Additionally, for all countries, industry and year effects are included in line with previous studies. Coefficient estimates of *Earnings* have a positive and significant impact on *CAR*s only for Nigerian firms. Co-efficient estimates for Kenya and South Africa, although positive, are statistically insignificant. Thus, the hypothesis that market reaction to earnings are influenced by the size of earnings (H10a), is supported only for the Nigeria sample, but rejected for both the Kenyan and South African sample. The positive and significant coefficient of Earnings in the Nigerian sample is consistent with the argument the earnings are important in determining the value of the firms. Further, of all the three countries, Nigeria has the shortest time frame for firms to report their earnings (90 days). Although this is not reflected in the summary statistics, it may suggest that earnings are considered relatively more important by regulators and market participants which may explain why it is significant in influencing market reactions to earnings.

Columns (2), (5) and (8) of Table 6.4 show the regression results for the impact of *Earnings Growth* on *CAR*. As already mentioned in Chapter 4, earnings in the previous year proxies for expected earnings due to the lack of analyst forecasts. Therefore, a higher value for Earnings Growth indicates better than expected earnings from the previous year, which is reasonable since developing markets are expected to be more synchronous and prices less fundamentals. Co-efficient estimates of *Earnings Growth* are statistically insignificant across all three countries, providing no support for hypothesis H10b, that *Earnings Growth* positively and significantly affects market reactions to earnings. A potential explanation for this is that market participants in these markets have no expectations relative to earnings and therefore, would not react to changes in earnings sufficiently enough to lead to a change in stock price. This could be attributed to the level of information flow and the absence of analysts.

Table 6.4: Regression analysis of Cumulative Abnormal Returns

This table presents results of regression analysis of cumulative abnormal returns (CARs) around the earnings event window (-10, +10) on a country by country basis. Earnings is the earnings of the firm scaled by total assets; Earnings Growth changes in earnings scaled by total assets; Positive to Negative is an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise; and Negative to Positive is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. Firm Size is measured as the natural logarithm of the firm's market value at the beginning of the year. Age is the number of years since the base date of the firm in Datastream. Leverage is computed as total debt divided by total assets at the beginning of the year. Trading Frequency is an indicator variable that takes the value of 1 if the firm is in the HTF category and 0 if in the MTF category. Synchronicity is the R-squared from a market model regression. Reporting Lag is the number of days between the fiscal year end of the firm and the earnings announcement date. T-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

Dependent Variable: CAR

	Kenya			**Nigeria**			**South Africa**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Earnings	0.1219			0.5988**			0.0120		
	(0.70)			(2.52)			(0.28)		
Earnings Growth		0.1592			0.2623			0.0609	
		(0.63)			(1.43)			(1.64)	
Positive to Negative			-0.0651**			0.0139			0.0011
			(-2.49)			(0.25)			(0.06)
Negative to Positive			0.0421			0.0071			0.0348*
			(1.18)			(0.13)			(1.90)
Firm Size	-0.0166	-0.0151	-0.0171	-0.0048	-0.0010	0.0009	-0.0038	-0.0034	-0.0022
	(-1.58)	(-1.43)	(-1.63)	(-0.40)	(-0.08)	(0.08)	(-0.93)	(-0.88)	(-0.55)
Age	0.0062	0.0055	0.0058	0.0187	0.0100	0.0064	0.0023	0.0017	0.0013
	(0.31)	(0.28)	(0.30)	(0.53)	(0.28)	(0.18)	(0.44)	(0.32)	(0.26)
Leverage	-0.1686**	-0.1824**	-0.1438**	0.2094*	0.1379	0.1462	0.0115	0.0133	0.0100
	(-2.21)	(-2.70)	(-2.10)	(1.93)	(1.47)	(1.64)	(0.64)	(0.74)	(0.54)
Trading Frequency	-0.0880***	-0.0871***	-0.0954***	-0.0226	-0.0237	-0.0193	-0.0218	-0.0211	-0.0225
	(-3.41)	(-3.39)	(-3.87)	(-0.53)	(-0.55)	(-0.49)	(-1.59)	(-1.56)	(-1.64)
Synchronicity	0.1133	0.1107	0.1149	0.0035	-0.0079	-0.0200	0.0572	0.0572	0.0538
	(1.43)	(1.38)	(1.44)	(0.04)	(-0.08)	(-0.21)	(1.37)	(1.39)	(1.30)
Reporting Lag	-0.0006	-0.0006	-0.0006	-0.0000	-0.0000	-0.0001	-0.0001	-0.0002	-0.0001
	(-1.31)	(-1.43)	(-1.48)	(-0.18)	(-0.10)	(-0.32)	(-0.63)	(-0.63)	(-0.48)
Constant	0.1206	0.1302	0.1416	0.0317	0.0695	0.0705	0.0361	0.0335	0.0275
	(0.98)	(0.99)	(1.08)	(0.37)	(0.84)	(0.93)	(1.05)	(0.98)	(0.78)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	188	188	188	122	122	122	1141	1141	1141
R^2	0.234	0.235	0.258	0.176	0.158	0.146	0.036	0.041	0.040

The insignificance of the *Earnings Growth* variable across all three countries may also be consistent with Wei and Zhang (2018) who argue that investors underact to earnings surprises in low trust regions. After all, trust by investors and other market participants is a function of rigorous accounting, investor protection, legal enforcement and corruption, most of which still leave much to be desired in these African markets.

The remaining columns of Table 6.4, (columns 3, 6 and 9), show regression results for the impact of changes in earnings from positive to negative (*Positive to Negative*) and negative to positive (*Negative to Positive*), on *CAR.* This effect is also meant to be considered a more behavioural than rational variable. There is a negative and significant co-efficient for the *Negative to Positive* variable in the Kenyan sample, implying less reactions to earnings when earnings change from positive to negative than when they change from negative to positive. Therefore the hypothesis that changes in earnings from positive to negative negatively affect the market reactions to earnings (H10C) is supported only in the Kenyan sample. This also suggests potential asymmetric price effects in the case of Kenya. Co-efficients estimates for Negative to Positive are only weakly significant for the South African sample, providing no strong support for the last hypothesis (H10d), that changes in earnings from negative to positive influence the market reactions to earnings positively. Overall, the limited evidence found in the positive co-efficient of Positive to Negative shows that the market reacts more strongly to bad news that good news and is also consistent with the view that behavioural biases could affect how accounting information may be incorporated into stock prices (Mian and Sankaraguruswamy 2012). They are also consistent with the idea of loss aversion, where there are higher reactions to earnings when there are losses rather than gains as individuals have a greater aversion for the former than the latter (Pinello 2008).

With respect to other variables, *Firm Size* appears to have no significant impact on the reactions to earnings around the event date. The impact of *Leverage* is mixed. Whilst there is a negative relationship between leverage and *CAR*s in Kenya, there is weakly significant and positive coefficient for leverage in Nigeria in column 4 of the table. The weakly positive coefficient observed in Nigeria is in line with the findings of Landsman et al. (2012) and Pevzner et al. (2015) who also find a positive relationship between leverage and the market reactions to earnings. The significant impact of leverage on *CAR*s in Nigeria can be explained by the notion that debt monitoring improves governance. Debt monitoring substitutes for improved governance in a country when national institutions are weak, and corruption is prevalent. Consistent with the arguments made on Table 6.3 that stocks in the HTF category may be more synchronously traded,

there is a negative coefficient for the *Trading Frequency* dummy which is significant in both the Kenyan and Nigerian Sample. Thus, liquidity has some impact on market reactions to earnings in terms of abnormal returns. With the exception of a weakly positive coefficient of *Synchronicity* in South Africa (columns 8 and 9), it can be observed that market reactions to earnings are not influenced by synchronicity.

Regression analysis of Abnormal Trading Volume (ATV)

Regression results of *ATV* are presented in Table 6.5. Similar to Table 6.4, year and industry effects are controlled for. The absolute value of *Earnings* and *Earnings Growth* are used to test how the magnitude of corporate earnings and changes in earnings, irrespective of the sign, impacts on *ATV*. There is a positive and significant coefficient for the magnitude of earnings (*Earnings*) in both Kenya and Nigeria. This implies that, whilst the absolute value of earnings may be sufficient to induce trading in Kenya, it may not be enough to cause a change in the share price as observe in Table 6.4, In the case of Nigeria, there is a significant impact of the value of earnings on *ATV*, consistent with the results in Table 6.4, implying that the value of earnings induces a change in both price and volume. The high level of the perception of corruption in Kenya may be a potential explanation for why *Earnings* and *Earnings Growth* in Kenya are only enough to trigger changes in trading volume but not sufficient to cause a change in the stock price. In South Africa, there is no significant impact on the magnitude of earnings and changes in earnings on *ATV*. Instead and consistent with the behavioural hypothesis, there is a only a weakly significant impact of changes in earnings from negative to positive on *CAR* as shown in Table 6.4. In addition, firm size loads negatively on *ATV* in South Africa and is consistent with the findings of Landsman et al. (2012) and Pevzner et al. (2015) who both include South Africa in their cross-country study.

Overall, coefficient estimates of *Earnings* and *Earnings Growth* in both Tables 6.4 and 6.5 are consistent with the views of Beaver (1968) that the usefulness of earnings data in triggering market reactions to earnings may be observed in either a test of price, volume or both, but should not be non-existent in both. Therefore, in terms of the four hypothesis on the impact of fundamentals (earnings characteristics) on earnings informativeness, the hypotheses can be accepted for the impact of the magnitude of earnings (only in Nigeria), changes in earnings (both Kenya and Nigeria) and changes in earnings from positive to negative (only Kenya). These differences as earlier explained may be function of the level of institutional development.

Table 6.5: Regression analysis of Abnormal Trading Volume

This table presents results of regression analysis of Abnormal Trading Volume (ATV) around the earnings event window (-10, +10) on a country by country basis. *Earnings* is the earnings of the firm scaled by total assets; *Earnings Growth* is change in earnings scaled by total assets*; Positive to Negative is* an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise; and *Negative to Positive* is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. For brevity definitions of the control variables are excluded. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively

Dependent Variable: ATV

	Kenya			**Nigeria**			**South Africa**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
| Earnings|	2.8913**			6.4260***			-0.3981*		
	(2.16)			(2.93)			(-1.93)		
| Earnings Growth) |		3.7939			4.5491***			0.1013	
		(1.24)			(2.95)			(0.56)	
Positive to Negative			-0.0365			0.2590			-0.0173
			(-0.12)			(0.46)			(-0.20)
Negative to Positive			0.4063			0.1142			0.2391
			(0.84)			(0.65)			(1.42)
Firm Size	-0.0803	-0.0434	-0.0590	-0.0350	-0.0227	0.0131	-0.0544**	-0.0493*	-0.0438*
	(-1.15)	(-0.59)	(-0.88)	(-0.55)	(-0.25)	(0.16)	(-2.04)	(-1.92)	(-1.79)
Age	0.1210	0.1269	0.1111	-3.7971***	-3.8471***	-3.8855***	-0.0126	-0.0093	-0.0141
	(1.00)	(1.10)	(0.93)	(-17.53)	(-16.70)	(-16.03)	(-0.31)	(-0.23)	(-0.35)
Leverage	0.8094	0.2752	0.5554	0.1897	-0.6494	-0.3893	-0.2266	-0.2284	-0.2225
	(1.04)	(0.33)	(0.62)	(0.33)	(-0.83)	(-0.54)	(-1.56)	(-1.58)	(-1.52)
Trading Frequency	-0.0632	-0.1345	-0.1425	-0.0381	-0.1313	-0.0320	-0.0329	-0.0419	-0.0402
	(-0.32)	(-0.76)	(-0.72)	(-0.13)	(-0.36)	(-0.09)	(-0.39)	(-0.49)	(-0.48)
Synchronicity	-0.0145	-0.1174	-0.0425	0.4945	0.5594	0.2924	-0.0070	-0.0264	-0.0403
	(-0.02)	(-0.17)	(-0.06)	(0.83)	(0.93)	(0.49)	(-0.03)	(-0.11)	(-0.17)
Reporting Lag	0.0001	-0.0008	-0.0007	-0.0017	-0.0020	-0.0014	-0.0014	-0.0014	-0.0011
	(0.07)	(-0.53)	(-0.42)	(-1.13)	(-1.25)	(-0.87)	(-0.97)	(-0.99)	(-0.80)
Constant	0.9724	1.0468	1.2442*	6.1433***	6.6282***	6.3806***	1.9435***	1.8569***	1.8183***
	(1.42)	(1.56)	(1.97)	(13.64)	(9.75)	(10.32)	(6.74)	(6.73)	(6.65)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	188	188	188	122	122	122	1141	1141	1141
R^2	0.153	0.156	0.141	0.344	0.340	0.300	0.034	0.032	0.036

6.5 Additional analyses and robustness tests

To test the robustness of our results, an alternative dependent variable is used which captures price, *Differenced Abnormal Returns* (*DAR*s) and provide results for comparison to those in Tables 5 and 6. *DAR*s are computed as the average abnormal return during the event window minus the average abnormal return in a ±60 period prior the event window. This is similar in spirit to the differenced volatility variable used in Griffin et al. (2011) except that it does not use absolute values of abnormal returns. Results of these are presented in Table 6.6. Three differences are notable. Firstly, the significance of *Positive to Negative* dummy for Kenyan companies is no longer present. Secondly, *Change in Earnings* becomes insignificant for *HTF* companies in South Africa whilst it becomes significant for Nigerian *HTF* companies. The latter finding is also present in abnormal trading volume models in Table 6.4. The conclusions regarding the impact of earnings information, synchronicity and trading frequency on both prices and volume remain unaltered.

Again, it has been argued that ownership structure could affect the extent to which stocks trade (Gompers et al. 2003). Different types of ownership structure have therefore been found to have an impact on stock price informativeness including ownership concentration (Fan and Wong 2002); government ownership (Ben-Nasr and Cosset 2014) block holdings (Brockman and Yan 2009) and institutional investors (Boehmer and Kelley 2009). One may, therefore, argue that the impact of the trading frequency (liquidity) measures on earnings informativeness could be explained by differences in the ownership structure of firms in the sample. This conjecture is tested by using yearly ownership data to examine whether there are significant differences in ownership structure between HTF and MTF stocks. However, as can be seen from Table 6.7, there are no significant differences in ownership between HTF and MTF stocks. Hence the finding that the more illiquid MTF stocks are driving earnings informativeness is not explained by ownership structure. It should, however, be noted that our data on ownership is rather scant[11] and it is recommended that future work could explore ownership structure more extensively given available data.

[11] Unfortunately, there are a lot of missing observations in the ownership data which account for the rather small number of observations (N) we have in Table 6.7

Table 6.6: Regression analysis of Differenced Abnormal Returns (DARs)

This table presents results from results of regression analysis on DARs around the earnings event window (-10, +10) on a country by country basis. DARs are computed as $\left(\frac{1}{N}\sum_{i=1}^{N}\frac{1}{21}\sum_{t=-10}^{10}AR_{i,t}\right)-\left(\frac{1}{N}\sum_{i=1}^{N}\frac{1}{120}\left(\sum_{t=-11}^{-70}AR_{i,t}+\sum_{t=11}^{70}AR_{i,t}\right)\right)$.*Earnings* is the earnings of the firm scaled by total assets; *Earning Growth* is change in earnings scaled by total assets ; *Positive to Negative* is an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise; and *Negative to Positive* is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. *T*-statistics based on standard errors adjusted for heteroscedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

Dependent Variable: DARS									
	Kenya			**Nigeria**			**South Africa**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Earnings	0.0034			0.0282**			0.0016		
	(0.39)			(2.58)			(0.87)		
Earnings Growth		0.0097			0.0187**			0.0024*	
		(1.00)			(2.12)			(1.83)	
Positive to Negative			-0.0021			-0.0004			-0.0003
			(-1.40)			(-0.15)			(-0.39)
Negative to Positive			0.0023			0.0012			0.0010
			(1.48)			(0.52)			(1.29)
Firm Size	-0.0004	-0.0004	-0.0004	-0.0000	0.0001	0.0002	0.0001	0.0001	0.0001
	(-0.89)	(-0.80)	(-1.00)	(-0.10)	(0.18)	(0.42)	(0.46)	(0.69)	(0.78)
Age	0.0003	0.0002	0.0002	-0.0012	-0.0015	-0.0018	0.0000	0.0000	0.0000
	(0.31)	(0.20)	(0.25)	(-0.74)	(-0.97)	(-1.12)	(0.20)	(0.03)	(0.04)
Leverage	-0.0056	-0.0057*	-0.0049	0.0119**	0.0083*	0.0092**	0.0007	0.0006	0.0006
	(-1.47)	(-1.73)	(-1.37)	(2.45)	(1.93)	(2.15)	(0.85)	(0.76)	(0.65)
Trading Frequency	-0.0037***	-0.0036***	-0.0040***	-0.0006	-0.0008	-0.0004	-0.0007	-0.0007	-0.0007
	(-2.80)	(-2.73)	(-3.22)	(-0.31)	(-0.43)	(-0.23)	(-1.20)	(-1.19)	(-1.23)
Synchronicity	0.0048	0.0047	0.0049	-0.0010	-0.0012	-0.0018	-0.0008	-0.0009	-0.0010
	(1.23)	(1.20)	(1.25)	(-0.23)	(-0.28)	(-0.40)	(-0.43)	(-0.48)	(-0.53)
Reporting Lag	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-1.14)	(-1.25)	(-1.33)	(-0.73)	(-0.58)	(-0.72)	(-0.41)	(-0.45)	(-0.33)
Constant	0.0028	0.0036	0.0040	0.0049	0.0067*	0.0062*	0.0002	0.0001	0.0001
	(0.54)	(0.63)	(0.73)	(1.31)	(1.91)	(1.83)	(0.14)	(0.09)	(0.04)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	188	188	188	122	122	122	1141	1141	1141
R^2	0.216	0.223	0.234	0.148	0.145	0.118	0.022	0.025	0.023

Table 6.7: Differences in ownership structure between HTF and MTF stocks.

This table presents summary statistics of five different types of ownership structures and test of mean differences between HTF and MTF stocks. N denotes the number of observations in each case.

	HTF			MTF			Diff
	N	Mean	Std	N	Mean	Std	(p-value)
Largest Shareholder	77	0.328	0.22	579	0.309	0.19	(0.402)
Top 5 Shareholders	77	0.577	0.25	579	0.547	0.251	(0.352)
Government Ownership	8	0.133	0.088	31	0.24	0.193	(0.134)
Institutional Ownership	77	0.321	0.221	579	0.329	0.234	(0.796)
Families and Individuals	36	0.042	0.086	264	0.075	0.099	(0.053)

The appendix to the chapter provides some additional tables in respect of both Abnormal Returns and Normalised Volatility. Appendix 6.1 shows Cumulative Average Abnormal Returns (CAAR) for the same set of event windows as computed for normalised volatility. Appendix 6.2 shows Daily Average Abnormal Returns to earnings announcements over the main event window, (-10, +10). Appendix 6.3 presents Daily Cumulative Average Abnormal Returns to earnings announcements over the main event window. Appendix 6.3 shows more significance of abnormal returns as the reaction to earnings may take a bit of time to get impounded in to the stock prices. Appendix 6.4 show the pattern of cumulative abnormal returns event window respectively. Finally Appendix 6.5 presents differences in Normalised volatility between samples grouped according to quartiles of firm's size. This was done to further investigate whether differences in informativeness could be due to size differentials across countries

6.6 Conclusion

Whilst the literature on the informativeness of earnings in an international context continues to develop, there remains relatively little evidence on African markets, which differ considerably in terms of institutional and regulatory factors when compared with more developed markets (Hearn and Piesse 2013, Asongu 2014).[12] The chapter adds to this literature by examining market responses to earnings announcements for a set of common law (i.e., market-based) African countries and investigate whether considering

[12] Institutional and regulatory factors might include but are not limited to timing of earnings announcements, channels by which earnings are reported (newsprint, websites, social media, etc) and insider trading enforcement.

that these markets are developing, reactions to earnings announcements are influenced by firm fundamentals or trading frequency.

Earnings announcements were collected and categorised according to the percentage of non-zero returns in the prior year of trading of the stock concerned. In order to ensure sufficient liquidity to capture earnings information, firms below a 50% threshold were dropped. The sample used was further categorised into two groups according to their trading frequency. Stocks which traded on 75% or more trading days over the previous years were categorised as high trading frequency and sample stocks that traded less frequently than 75% (but more than 50%) of days in the previous year were categorized as medium trading frequency. Normalised volatility, abnormal trading volume, and market-adjusted *CAR*s were estimated for a ten-day window before and after the event. A cross-sectional analysis was then conducted to determine how earnings characteristics affect the market reactions to earnings announcements.

The findings reveal that, in terms of the preferred measure of normalised volatility, earnings are informative in all three countries. There is little evidence of leakage in the full sample, but significant information content is identified in other event windows. The results are strongly driven by the less regularly traded sample (*MTF*). Of the highly traded samples, only Kenyan stocks display significant informativeness. Nonetheless, for all three countries, informativeness is present for the more highly traded stocks in the post-event window.

In order to check for an asymmetric reaction to good and bad news, the informativeness of positive and negative *CAR*s was examined separately. The results for less frequently traded stocks mirror those of the full sample, i.e. positive normalised volatility across the sample but some leakage in South Africa. For negative news, the *HTF* sample indicates no leakage but significant positive normalised volatility around the event (-2 to +3) for Kenyan stocks and in the post-event window (+3 to +10) for Nigeria. Whilst the results indicate idiosyncrasies in the pattern of earnings informativeness; trading frequency has an important role in determining when earnings information is impounded into stock prices.

The effect of specific characteristics of earnings on market reactions using cross-sectional regression analysis is also carried out. The primary dependent variable is cumulative abnormal return, which unlike normalised volatility, captures both the

magnitude and direction of earnings variables. There is only limited evidence of an effect of earnings characteristics on market reactions. Earnings are only found to be significant for Nigeria (but strongly so). Changes in earnings are only weakly significant in South Africa and not in other countries in the sample. To test the effect of what one may consider behavioral variables, as opposed to fundamental earnings data, this chapter included variables that capture changes in earnings from positive to negative and vice versa in the analysis. Changes from positive to negative are strongly significant and negative for Kenyan companies but not for companies in other countries. With abnormal trading volume as an alternative dependent variable, it can be observed that earnings are informative for both Kenya and Nigeria. The *Change of Earnings* variable is significant for Nigerian companies. Notably, a dummy variable indicating changes in earnings from negative to positive was found to be significant for South African companies. Tests using differenced volatility confirm results from the earlier analysis.

Whilst the role of trading frequency is clear in the results, there is no direct association between synchronicity and earnings informativeness. If African stocks are more synchronous with market movements and less associated with earnings news, then we would expect stock price effects (positive or negative) to earnings announcements to be lower for stocks which are more synchronous and higher for those which are less associated with market movements. The cross-sectional analysis provides no evidence of such an effect. However, one of the most notable results, that earnings announcements by medium traded stocks are more informative than highly traded stocks, indicating that pricing of more liquid stocks is less driven by earnings announcements. Contrary to the findings in this chapter, Miao and Yeo (2009) document that more liquid stocks will lead to a larger market reaction to earnings announcement in the US stock market. They argue that illiquidity will result in a larger trading cost, making investors reluctant to respond to earnings. Such a view is also supported by Chordia et al. (2009). They document that post-earnings announcement drift is more prevalent for highly illiquid stocks since investors delay the response to earnings due to the high trading costs. Whilst the findings that illiquidity will result in larger market responses in African markets is counterintuitive, it may result from synchronicity of the more highly traded stocks. This, in turn, may arise from index-tracking type investment strategies. Alternatively, earnings information may be communicated via less formal mechanisms, such as via the media coverage or informal briefings to major shareholders, rather than the formal earnings announcement. However, the results of tests of behavioural variables suggest that other less sophisticated influences on pricing persist in African markets.

Overall, the findings in this chapter support the notion that African markets may not fit the stereotypical view of synchronous pricing (Morck et al. 2000). Earnings announcements in this sample carry important stock price implications although the association between the underlying earnings characteristics and stock price adjustments is less consistent. Contrary to popular belief, the findings demonstrate that earnings news is impounded into stock prices around the announcement date and that pricing, especially for less frequently traded stocks, relies on earnings news in African markets.

The next chapter of this thesis presents the third and final empirical analysis which examines how earnings informativeness is influenced by institutional development.

Chapter Appendices

Appendix 6.1: Cumulative Abnormal Returns for different event windows

This table presents cumulative abnormal returns for various event windows around earnings announcements. Panel A presents results for all earnings announcements. Panel B presents results for announcements with positive earnings. Panel C presents results for announcements with negative earnings. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively

PANEL A: ALL EARNINGS

Event Window	Full Sample			HTF			MTF		
	ALL	HTF	MTF	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
(-10,+10)	-0.858%***	-2.482%**	-0.664%**	-6.19%	-1.496%	-2.218%	-0.287%	-2.417%**	-0.463%
(-10,-3)	-0.214%	-1.585%***	-0.050%	-1.382%	-2.718%*	-1.307%**	-0.367%	-1.082%**	0.171%
(-2,+2)	-0.052%	-0.693%	0.024%	-2.707%	0.687%	-0.778%	-0.006%	-0.401%	0.096%
(-1,+1)	-0.034%	-0.008%	-0.037%	-1.732%	0.838%	0.009%	-0.310%	-0.307%	0.057%
(-1,+0)	-0.032%	0.002%	-0.037%	-0.870%	1.221%	-0.203%	-0.344%	0.021%	0.013%
0	-0.037%	-0.016%	-0.039%	-0.716%	0.806%	-0.139%	-0.649%***	-0.188%	0.099%
(0,+1)	-0.038%	-0.027%	-0.039%	-1.578%	0.423%	0.073%	-0.614%	-0.516%	0.144%
(0,+3)	-0.226%	-1.096%**	-0.122%	-2.627%	0.430%	-1.290%**	-0.438%	-0.268%	-0.040%
(+3,+10)	-0.592%***	-0.204%	-0.638%***	-2.106%	0.535%	-0.133%	0.086%	-0.934%	-0.730%***

PANEL B: POSITIVE EARNINGS

Event Window	Full Sample			HTF			MTF		
	ALL	HTF	MTF	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
(-10,+10)	-0.784%***	-3.269%***	-0.502%	-5.599%*	-1.806%	-3.313%**	0.252%	-2.079%**	-0.396%
(-10, -3)	-0.208%	-1.661%***	-0.043%	-1.411%	-2.610%	-1.426%**	-0.281%	-0.834%	0.129%
(-2,+2)	-0.016%	-0.867%	0.081%	-1.928%	0.828%	-1.186%	0.366%	-0.207%	0.072%
(-1,+1)	-0.023%	-0.140%	-0.009%	-1.217%	1.304%	-0.383%	-0.009%	-0.184%	0.018%
(-1,0)	0.011%	0.094%	0.002%	-0.455%	1.627%	-0.263%	-0.088%	0.048%	0.012%
0	-0.019%	0.053%	-0.027%	-0.331%	1.078%*	-0.182%	-0.387%*	-0.146%	0.061%
(0,+1)	-0.053%	-0.180%	-0.039%	-1.094%	0.754%	-0.302%	-0.307%	-0.378%	0.067%
(0+3)	-0.238%	-1.125%*	-0.138%	-2.072%	0.459%	-1.431%**	-0.152%	-0.308%	-0.107%
(+3,+10)	-0.560%***	-0.741%	-0.540%***	-2.260%*	-0.024%	-0.701%	0.167%	-1.037%	-0.597%***

PANEL C: NEGATIVE EARNINGS

Event Window	Full Sample			HTF			MTF		
	ALL	HTF	MTF	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
(-10,+10)	-2.261%	2.018%	-3.076%*	-16.913%	0.99%	3.020%	-10.044%***	-8.242%*	-1.618%
(-10, -3)	-0.592%	-1.149%	-0.485%	-0.857%	-3.58%	-0.738%	-0.366%	-5.276%*	-0.018%
(-2,+2)	-0.481%	0.303%	-0.630%	-16.715%	-0.44%	1.172%	-7.246%***	-2.256%	0.423%
(-1,+1)	-0.211%	0.743%	-0.393%	-10.984%	-2.89%	1.884%	-6.181%***	-1.332%	0.480%
(-1,0)	-0.529%	-0.519%	-0.531%	-8.339%	-2.03%	0.084%	-4.568%**	-0.196%	-0.022%
0	-0.308%	-0.413%	-0.288%	-7.649%	-1.37%*	0.067%	-4.972%***	-0.681%	0.381%
(0,+1)	0.009%	0.849%	-0.151%	-10.295%	-2.22%	1.868%	-6.585%***	-1.818%	0.883%
(0+3)	-0.305%	-0.928%	-0.187%	-12.618%	0.20%	-0.616%	-7.366%***	0.635%	0.696%
(+3,+10)	-1.188%	2.863%	-1.960%**	0.659%	5.01%	2.586%	-2.432%	-0.710%	-2.023%**

Appendix 6.2: Daily Average Abnormal Returns to Earnings Announcements

This table presents daily average abnormal returns around earnings announcements. Abnormal returns are estimated using the market-adjusted model. HTF indicates high trading frequency stocks i.e. stocks which experienced a price change in at least 75% of trading days in the previous year. MTF indicates medium trading frequency stocks, i.e. stocks which experienced a price change on between 50% and 74.99% of trading days in the previous year. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.

PANEL A: DAILY AVERAGE ABNORMAL RETURNS

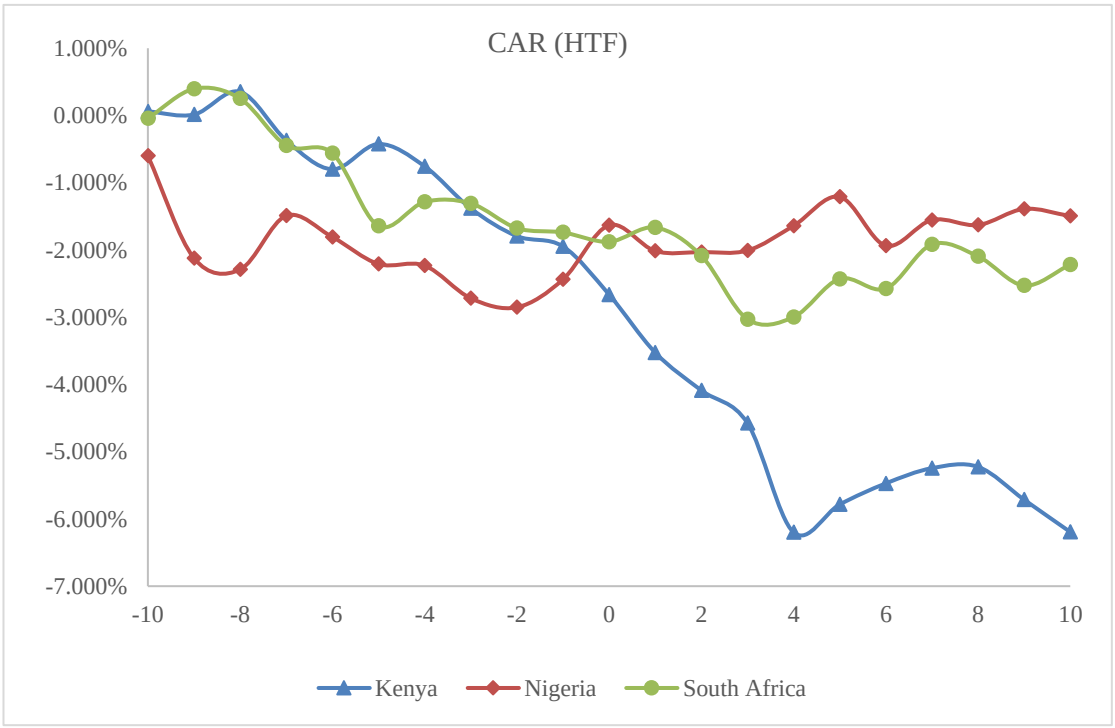
	ALL			HTF			MTF		
	Full Sample	HTF ALL	MTF ALL	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
Trading days	AAR	AAR	AAR	AAR	AAR	AAR	AAR	AAR	AAR
-10	-0.063%	-0.139%	-0.054%	0.060%	-0.600%	-0.042%	-0.022%	0.010%	-0.070%
-9	-0.010%	0.014%	-0.013%	-0.047%	-1.522%**	0.438%	0.019%	-0.222%	0.013%
-8	0.033%	-0.100%	0.049%	0.338%	-0.169%	-0.144%	0.035%	0.006%	0.058%
-7	0.086%	-0.412%	0.146%	-0.722%	0.800%	-0.696%	-0.103%	0.051%	0.208%
-6	-0.095%	-0.187%	-0.084%	-0.431%	-0.317%	-0.117%	-0.359%**	-0.131%	-0.025%
-5	-0.057%	-0.804%***	0.033%	0.376%	-0.401%	-1.081%**	0.008%	-0.220%	0.077%
-4	-0.094%	0.214%	-0.131%	-0.331%	-0.024%	0.357%	-0.010%	-0.512%**	-0.094%
-3	-0.013%	-0.171%	0.005%	-0.626%	-0.486%	-0.021%	0.065%	-0.065%	0.005%
-2	0.047%	-0.328%	0.091%	-0.412%	-0.135%	-0.368%	0.127%	-0.116%	0.117%
-1	0.004%	0.019%	0.003%	-0.154%	0.415%	-0.064%	0.304%	0.209%	-0.087%
0	-0.037%	-0.016%	-0.039%	-0.716%	0.806%	-0.139%	-0.649%***	-0.188%	0.099%
1	-0.001%	-0.011%	0.000%	-0.862%	-0.383%	0.212%	0.035%	-0.328%	0.045%
2	-0.065%	-0.356%	-0.031%	-0.563%	-0.016%	-0.419%	0.177%	0.022%	-0.078%
3	-0.123%	-0.713%**	-0.053%	-0.487%	0.023%	-0.944%**	-0.001%	0.226%	-0.106%
4	-0.093%	-0.072%	-0.095%	-1.624%**	0.367%	0.031%	-0.031%	-0.264%	-0.081%
5	-0.073%	0.527%	-0.144%	0.414%	0.431%	0.568%	0.259%	-0.333%	-0.191%*
6	-0.094%	-0.210%	-0.080%	0.313%	-0.727%	-0.145%	-0.166%	-0.185%	-0.048%
7	0.087%	0.561%	0.031%	0.227%	0.383%	0.656%	0.064%	0.075%	0.017%
8	-0.097%	-0.137%	-0.092%	0.020%	-0.075%	-0.176%	0.172%	0.014%	-0.159%*
9	-0.191%**	-0.311%	-0.177%**	-0.489%	0.239%	-0.435%	-0.117%	-0.422%	-0.150%
10	-0.009%	0.151%	-0.028%	-0.480%	-0.106%	0.311%	-0.093%	-0.044%	-0.013%

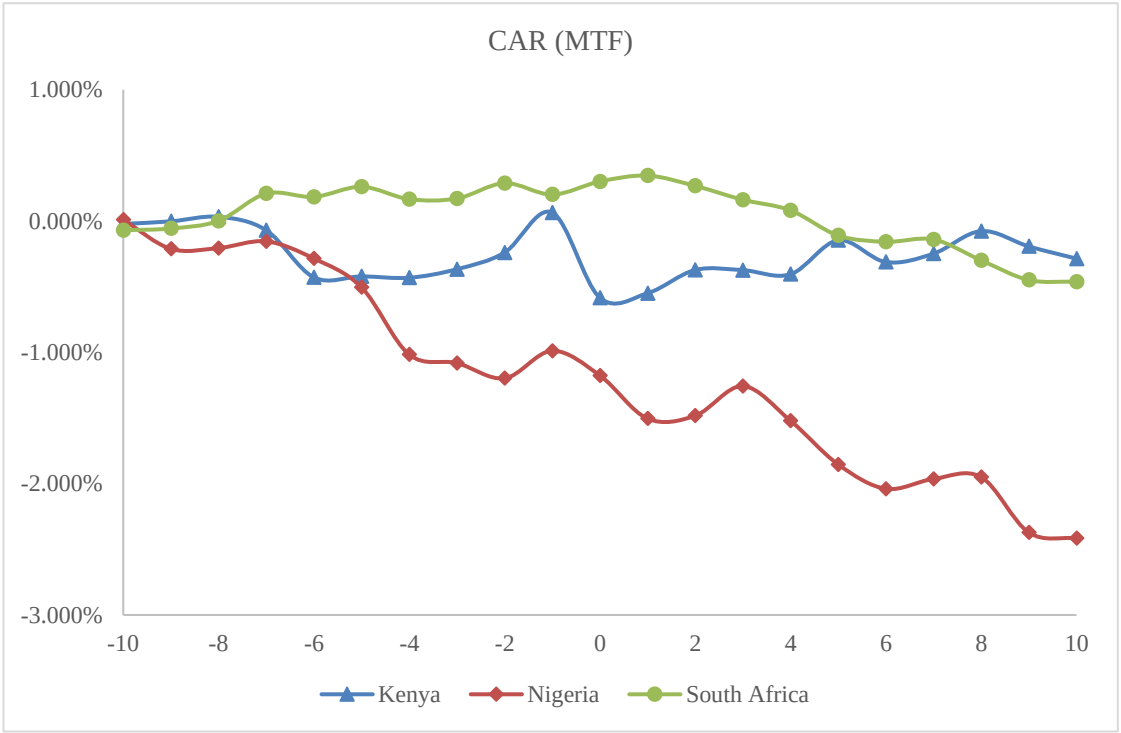
Appendix 6.3: Daily Cumulative Average Abnormal Returns to Earnings Announcements

This table presents daily cumulative abnormal returns around earnings announcements. Abnormal returns are estimated using the market-adjusted model HTF indicates high trading frequency stocks i.e. stocks which experienced a price change in at least 75% of trading days in the previous year. MTF indicates medium trading frequency stocks, i.e. stocks which experienced a price change on between 50% and 74.99% of trading days in the previous year. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively.

	ALL			HTF			MTF		
	Full Sample	HTF ALL	MTF ALL	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
Trading days	CAAR	CAAR	CAAR	CAAR	CAAR	CAAR	CAAR	CAAR	CAAR
-10	-0.063%	-0.139%	-0.054%	0.060%	-0.600%	-0.042%	-0.022%	0.010%	-0.070%
-9	-0.073%	-0.125%	-0.067%	0.014%	-2.122%***	0.396%	-0.003%	-0.212%	-0.057%
-8	-0.041%	-0.225%	-0.019%	0.352%	-2.291%**	0.251%	0.032%	-0.206%	0.001%
-7	0.046%	-0.638%	0.127%	-0.370%	-1.491%	-0.445%	-0.071%	-0.155%	0.209%
-6	-0.050%	-0.824%*	0.043%	-0.801%	-1.808%	-0.562%	-0.430%	-0.286%	0.184%
-5	-0.106%	-1.628%***	0.076%	-0.424%	-2.209%*	-1.643%***	-0.422%	-0.505%	0.260%
-4	-0.200%	-1.414%***	-0.055%	-0.756%	-2.232%	-1.286%**	-0.432%	-1.017%**	0.166%
-3	-0.214%	-1.585%***	-0.050%	-1.382%	-2.718%*	-1.307%**	-0.367%	-1.082%**	0.171%
-2	-0.167%	-1.913%***	0.042%	-1.794%*	-2.853%*	-1.675%**	-0.240%	-1.198%**	0.288%
-1	-0.162%	-1.894%***	0.044%	-1.948%*	-2.438%	-1.739%**	0.064%	-0.989%*	0.201%
0	-0.199%	-1.910%***	0.005%	-2.664%*	-1.632%	-1.878%	-0.585%	-1.176%**	0.301%
1	-0.200%	-1.921%***	0.005%	-3.526%	-2.015%	-1.666%	-0.550%	-1.505%**	0.345%
2	-0.266%	-2.277%***	-0.025%	-4.088%	-2.031%	-2.085%**	-0.373%	-1.483%**	0.267%
3	-0.389%	-2.990%***	-0.078%	-4.575%	-2.008%	-3.029%***	-0.374%	-1.257%*	0.162%
4	-0.481%*	-3.062%***	-0.173%	-6.199%**	-1.641%	-2.998%***	-0.406%	-1.521%**	0.081%
5	-0.554%*	-2.535%***	-0.317%	-5.785%**	-1.210%	-2.430%**	-0.146%	-1.854%**	-0.111%
6	-0.648%**	-2.745%**	-0.398%	-5.472%*	-1.937%	-2.575%**	-0.313%	-2.039%***	-0.158%
7	-0.561%*	-2.185%**	-0.367%	-5.245%**	-1.554%	-1.918%	-0.249%	-1.964%**	-0.141%
8	-0.658%**	-2.322%***	-0.459%	-5.226%**	-1.629%	-2.094%	-0.077%	-1.950%**	-0.300%
9	-0.849%***	-2.633%***	-0.636%*	-5.714%**	-1.390%	-2.529%**	-0.194%	-2.372%***	-0.449%
10	-0.858%***	-2.482%***	-0.664%**	-6.194%**	-1.496%	-2.218%	-0.287%	-2.417%**	-0.463%

Appendix 6.4: Cumulative abnormal returns during the event window





Appendix 6.5: Size differences in normalized volatility

This table presents event reaction results for portfolios of the firm created according to quartiles of firm size. Earnings reaction is measured by normalized volatility which is computed as Panel A presents results for Kenya, Panel B for Nigeria and Panel C for South Africa. ***, ** and * denote statistical significance at the 1% , 5% and 10% respectively.

Kenya					
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	T-stat [Quartile 4- Quartile 1
(-10,+10)	0.080*	0.166***	0.167***	0.075*	[0.925]
(-10,-3)	-0.004	0.003	0.012	-0.075	[0.358]
(-2,+2)	0.231***	0.549***	0.390***	0.330***	[0.423]
(-1,+1)	0.252***	0.825***	0.521***	0.436***	[0.248]
(-1,0)	0.188	0.499***	0.374**	0.287**	[0.587]
0	0.268*	0.566***	0.607***	0.547**	[0.341]
(0,+1)	0.321***	1.000***	0.705***	0.638***	[0.138]
(0,+3)	0.238***	0.690***	0.452***	0.374***	[0.312]
(+3,+10)	0.081	0.092*	0.196***	0.078	[0.966]
Nigeria					
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	T-stat[Quartile 4- Quartile 1
(-10,+10)	0.124**	0.091	0.110**	0.165***	[0.548]
(-10,-3)	0.005	0.015	-0.009	0.035	[0.763]
(-2,+2)	0.137	0.134	0.237**	0.254***	[0.358]
(-1,+1)	0.268**	0.151	0.249*	0.393***	[0.464]
(-1,0)	0.266**	0.175	0.271*	0.242*	[0.900]
0	0.408***	0.258	0.687***	0.593**	[0.508]
(0,+1)	0.336**	0.185	0.451**	0.643***	[0.152]
(0,+3)	0.239**	0.193	0.329***	0.399***	[0.323]
(+3,+10)	0.253***	0.156**	0.180**	0.227***	[0.822]
South Africa					
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	T-stat[Quartile 4- Quartile 1
(-10,+10)	0.020	0.042	0.014	0.010	[0.658]
(-10,-3)	0.028	0.060	0.019	0.010	[0.569]
(-2,+2)	-0.042	0.029	0.009	0.000	[0.233]
(-1,+1)	-0.028	0.051	0.017	0.024	[0.252]
(-1,0)	-0.048	0.023	-0.013	-0.004	[0.407]
0	-0.044	0.048	0.028	0.063	[0.176]
(0,+1)	-0.016	0.076*	0.052	0.071*	[0.132]
(0,+3)	-0.036	0.057	0.016	0.023*	[0.158]
(+3,+10)	0.084***	0.052**	0.042	0.043*	[0.249]

Chapter 7

Earnings Informativeness: The Role of Institutional Development

7.1 Introduction

As mentioned in Chapter 3, there is a large body of literature that investigates the informativeness of earnings in an international context. The purpose of this chapter is to examine further the impact of two institutional factors that are of particular relevance to developing countries. The first is the expected improvement in accounting standards as a result of the mandatory adoption of IFRS. A survey of the literature on IFRS adoption by Leuz and Wysocki (2016) finds that its impact on the quality of accounting numbers have been mixed.[13] Consequently the impact of IFRS adoption on the market reaction to earnings announcements across countries is still open for debate. One key study that has provided direct evidence on the impact of IFRS adoption on the market reaction to earnings is Landsman et al. (2012). Using a sample of 16 countries, they find that market reactions to earnings increase after the mandatory adoption of IFRS in these countries. However, they add that this effect depends on how strongly rules are enforced in adopting countries. Houqe et al. (2012), in a study of 46 countries, come to a similar conclusion when they find that earnings quality increases after mandatory adoption of IFRS in countries that have a strong investor protection regime. This therefore suggest that studies of the impact of IFRS adoption on earnings and earnings responses may require a focus on individual countries.

The second institutional factor, which is yet to gain prominence in the literature on earnings informativeness, relates to the impact of the perception of corruption.[14] In their theoretical paper, Shleifer and Vishny (1993) argue that the secrecy around corruption makes it distortionary and costly, which ultimately impedes development in the long run. Since then there have been some economic studies on corruption at the country level (Mo 2001). However, specific firm channels by which corruption could affect economic outcomes remain open for debate and empirical scrutiny. In this chapter, it is hypothesised that corruption as a political and socio-economic phenomenon, erodes public trust. The continuous erosion of trust, as a result of perception of the presence of corruption, will eventually lead to a situation where information transmitted by economic agents becomes

[13] See hypothesis development section of this chapter for details of some of these studies.

[14] This chapter focuses on the perceptions of corruption and not actual corruption as actual corruption is hard to measure. However, studies such as Houqe and Monem (2016) argue that actual corruption and perception of corruption are somehow interrelated because actual corruption fuels the perception of corruption. The perception of corruption is however more important for the purposes of this analyses also because, perception of corruption can exist even in the absence of actual corruption (Melgar et al. 2010)

less and less valuable to anyone including investors. As mentioned in the previous chapter, the earnings report is a major means of information transmission from managers to investors. Hence, this chapter tests the impact of perceptions on the value of information associated with earnings announcements.

The connection between corruption and the belief investors have in markets is by no means trivial. As La Porta et al. (2000) state, investor protection mechanisms, are instituted to provide a legal and regulatory framework that protects investors. The prevalence of corruption implies that laws that are meant to safeguard the interest of investors and other market participants are either not enacted or, if enacted not enforced. It is for this reason that many studies posit that countries with high levels of corruption tend to be associated with poor investor protection (Giofré 2014, Beuselinck et al. 2017). Indeed, studies such as Behn et al. (2013) include corruption as a component variable in their construction of investor protection indices.

Taken the above together, this chapter examines the effect of institutional factors on earnings informativeness by looking at the separate and joint influences of IFRS adoption and the perceptions of corruption. Normalised volatility increased in the post IFRS adoption period for the Nigerian sample. Normalised volatility in South Africa, however, does not appear different between the pre and post mandatory IFRS adoption periods. The findings in South Africa could be explained by the very early harmonisation of IFRS with domestic standards in South Africa. Multivariate analysis in this chapter, however does not provide any evidence of the impact of IFRS on both CARs and ATV. This leads to the overall conclusion that the impact of IFRS adoption had little or no impact on the informativeness of earnings in the sample countries and companies, lending support to the view that the impact of IFRS can only be realised when there is strong enforcement of rules. With regards to the perception of corruption, the findings show that corruption has a negative and significant impact on the market reaction to earnings in terms of trading volume but not price. Investors in countries with higher perceived levels of corruption trade less when earnings are announced. Given that trading volume reflects the real actions of investors around the earnings announcement date, this finding is intuitively appealing in a sense that, if investors are sceptical about accounting information due to increasing levels of the perception of corruption in countries, less trading activity will be generated around the release of earnings information. However, the negative impact of corruption on earnings informativeness disappears in the post IFRS mandatory adoption period. This provides some evidence to suggest that improvements

in financial governance such as the improvement of Accounting Standards can moderate the adverse impact of corruption on capital markets.

Overall, this chapter makes some important contributions to the literature. First, it contributes to the growing literature on how structural and institutional factors affect earnings informativeness. Specifically with regards to the impact of IFRS adoption, the analysis adds to the work of Landsman et al. (2012) by showing that although IFRS led to increase in market reactions to earnings in a combined sample of countries, an examination of individual countries, given differences in investor protection mechanisms, can provide evidence to the contrary. The analysis in this chapter shows that specific country factors and processes leading to adoption might help explain cross-country variations on the capital market effects of IFRS adoption. Also, the capital markets implications of corruption have been overlooked. However, for developing markets such as those used in this study, the perceptions of corruption may be an important consideration for investors. The inclusion of corruption in this strand of literature, therefore, makes a significant contribution, particularly as countries in the sample, tend to be characterised by weaker legal and economic institutions. Finally, the chapter extends the literature on corruption by showing that it has implications for firm-level outcomes. From a policy perspective, it is relevant for policymakers to know that financial markets can only the gain confidence of investors if the general legal, political and economic frameworks are strengthened.

The chapter is organised as follows: Section 7.2 develops the hypotheses to be tested. Section 7.3 provides details of the empirical design. The empirical analyses are presented in Section 7.4. Section 7.5 provides some additional analyses and robustness checks. Section 7.6 concludes.

7.2 Hypotheses development

This section formulates the hypotheses to be tested.

The impact of IFRS adoption on earnings informativeness

The adoption of IFRS requires publicly listed companies to adopt a set of single high-quality standards with the view to facilitating the cross-border comparability, reducing information asymmetry, as well as increasing reporting transparency (Ball 2006). Thus, the theoretical arguments in favour of the capital market benefits of IFRS adoption including earnings informativeness are based mainly on the premise of improved

transparency and comparability (Jeanjean and Stolowy 2008). They argue that the mandatory adoption of IFRS lead firms to improve quality of financial reporting as IFRS reduces the amount of discretion relative to many local Generally Accepted Accounting Principles (GAAP). IFRS adoption will therefore lead to an increase in reporting quality (Barth et al. 2008). The comparability argument, put forward by Armstrong et al. (2010), is based on the premise that IFRS adoption makes it easier and cheaper for investors to compare firms across markets. This implies that, even without an increase in reporting quality, financial information becomes more useful to investors and can help to reduce information asymmetry as investors will be able to differentiate between lower and higher quality financial information (Jeanjean and Stolowy 2008). To this end, we can expect the mandatory adoption of IFRS to lead to greater earnings informativeness and market reaction to earnings. However, despite the intuitively appealing premise for the adoption of IFRS, and the evidence of its capital market benefits, there are opposing views. A key argument in this strand of literature is based on the idea that the adoption of a single set of accounting standards does not necessarily address differences in the institutional features of countries (Ball et al. 2000, Ball 2006). This raises genuine questions about whether developing countries, characterised by weak rule of law, poor investor protection and widespread corruption, can reap the capital market benefits of the adoption of IFRS. Moreover, firms may also have different reporting incentives which can limit the importance of accounting standards in determining reporting quality and earnings informativeness (Ball et al. 2000, Ball et al. 2003, Burgstahler et al. 2006). Thus, there still remains an empirical question as to whether the adoption of IFRS could improve earnings informativeness in different in different jurisdictions. As already indicated in Chapter 2 of this thesis, one of the main challenges of the African markets is the weak enforcement of laws, regulations and corporate governance. Based on this premise, one is not likely to observe significant improvement in the market reactions to earnings following the mandatory adoption of IFRS. This leads to the first hypothesis which is stated in alternative form as follows:

H11: Adoption of IFRS does not increase earnings informativeness in African markets

The impact of perception of corruption

As mentioned earlier, research on how country-level corruption influences the utilisation of accounting information by investors has been scarce. Javorcik and Wei (2009) argue that high level of corruption could worsen the problem of information asymmetry or the perception of its existence. Many studies have shown that corruption decreases investment which ultimately leads to a decrease in financial development and economic

growth (Mauro 1995, Wei 2000, Knill 2013, Jain et al. 2017, Bodnaruk et al. 2017). But if investors provide funds despite the prevalence of corruption, it remains to be seen whether accounting disclosure is informative or is treated with scepticism. On the one hand, and based on the view that corruption could have implications for financial markets, one may expect a corruption proxy to be associated with reduced informativeness i.e a negative coefficient if investors respond less to observations more exposed to corruption. In Chapter 2, one of the institutional challenges about markets in the sample, and African markets in general, is corruption and its perception. Countries in African markets continue to rank poorly in comparison to other African countries in various corruption perception surveys. One major concern about the impact of corruption in Africa has always been about its impact on economic growth (d'Agostino et al. 2016). Given the high prevalence of corruption on the African continent, this chapter hypothesises that the impact of corruption can also manifest via firm level outcomes in terms of how investors perceive and react to accounting information of firms operating in these markets. This leads to the next hypothesis that;

H12: The perception of corruption is negatively associated with earnings informativeness.

7.3 Empirical design

The measures of earnings informativeness used in this chapter are the same as those used in Chapter 6. Normalised volatility which compares, volatility in the event window to volatility outside of the event window, is used in univariate analyses. In multivariate analyses, the measures of informativeness are Cumulative Abnormal Returns (CAR) and Abnormal Trading Volume (ATV).

With regards to testing for the impact of IFRS adoption, the analysis focuses on Nigeria and South Africa. Both countries instituted a mandatory switch from domestic standards to IFRS in 2012 according to their IFRS profiles published on https://www.ifrs.org. The adoption of IFRS in Kenya precedes the start of the sample period. For the purposes of analysis in this chapter, the Pre-IFRS adoption period is 2005-2012 whilst the post-IFRS adoption period is 2013-2015. It is however important to mention that in the case of South Africa, the Johannesburg Stock Exchange Listing Requirements have required listed firms to use IFRS since January 2005. In some instances where companies are unable to comply due to such factors as dual listing, they have to make a disclosure to that effect. Further, Regulations enacted under the

Companies Act of 2008 continued to permit the use of South African GAAP as it was mostly similar to IFRS due to harmonisation. As a result of this, the use of South African GAAP was fully withdrawn in 2012 making IFRS the only applicable accounting standard. Hence the results on South Africa need to be interpreted within this context as prior to 2012, there was already a significant overlap between local South African GAAP and IFRS. However, given this does not affect conclusions drawn from the Nigerian Sample and the overall arguments in the chapter.

In univariate analyses, normalised volatility is computed for each country in both periods. In multivariate analyses, and to further test whether the market reaction to earnings is greater after the mandatory adoption of IFRS, the following model is estimated for each of the two countries in the spirit of Landsman et al. (2012).

$$\begin{aligned} Market\ Reaction_{it} &= \alpha_i + \beta_1 IFRS + \beta_2 Earnings_{it} + \beta_3 Earnings\ Growth_{it} \\ &+ \beta_4 Earnings\ x\ IFRS_{it} + \beta_5 Earnings\ Growth\ x\ IFRS_{it} \\ &+ \sum_k \beta_k Controls_{it}^k + \varepsilon_{it} \end{aligned} \quad 7.1$$

Where for each firm i, market reaction is either *CAR* or *ATV* at time t. *CAR* is the -10,+10 market-adjusted cumulative abnormal returns to earnings at year. *ATV* is the abnormal trading volume which is estimated as the average trading volume of the stock during the event window scaled by the average trading volume over a 2 month (60 days) period prior to the event window. IFRS is an indicator variable which takes the value of 1 for any of the years 2013, 2014 or 2015 and zero otherwise. All other variables (Earnings, Earnings Growth and those listed as controls), are as defined previously. An interaction term for Earnings and IFRS and Earnings Growth and IFRS has been included to ascertain differences in the impact of the size and growth of earnings between the pre- and post-IFRS adoption periods.

The impact of corruption on earnings informativeness is examined by estimating the following regression model.

$$\begin{aligned} Market\ reaction = \alpha_i + \beta_1 Corruption + \beta_2 Auditing\ and\ Reporting\ Standards + \\ \sum_k \beta_k Controls_{it}^k + \varepsilon_{it} \end{aligned} \quad 7.2$$

Where market reaction refers to both CAR and ATV. *CAR* is the -10, +10 market-adjusted cumulative abnormal returns to earnings at year. *ATV* is the abnormal trading volume which is estimated as the average trading volume of the stock during the event window scaled by the average trading volume over a 2 month (60 days) period prior to the event window. Corruption is the inverse of the transparency international corruption index score in year t for each country. Higher scores denote higher levels of perceived corruption. Auditing and Reporting Standards is a country's score on the quality of its Auditing and reporting standards according to the Global competitiveness index. Again, the set of controls are as defined in Chapter 4.

In order to investigate whether the mandatory adoption of IFRS has a moderating effect on the impact of corruption on market reactions, equation 7.2 is re-estimated to include an interaction term for IFRS with corruption.

7.4 Empirical results

This section presents the results of the empirical analyses of the chapter.

7.4.1 Normalised volatility pre and post-IFRS adoption

Normalised volatility in both the Pre-IFRS and Post-IFRS adoption period are presented in Table 7.1. Panel A presents normalised volatility for all earnings announcements whilst normalised volatility for good and bad news are presented in Panels B and C respectively. These are presented for a range of event windows similar to Table 6.3 in Chapter 6. For the main event window (-10, +10) in Panel A, the average normalised volatility in the Pre-IFRS period for firms in Nigeria is 0.052 or 5.2%. In the Post-IFRS window it is much higher at 0.157. Across all event windows in Panel A of the table, normalised volatility in the Post-IFRS period is greater than normalised volatility in the Pre-IFRS period. Interestingly, the only negative average normalised volatility for Nigeria in Panel A is observed in the event window preceding the event date (-10, -3). This is the case for both the Pre and Post IFRS adoption periods. However, consistent with the positive normalised volatility figures in the other event windows, those of the pre-event window are greater implying that IFRS adoption results in increased informativeness of earnings in Nigeria.

Table 7.1: Normalised volatility: Pre and Post IFRS adoption

This table presents earnings event reaction results in the form of normalized volatility in the Pre- and Post IFRS adoption period for Nigeria and South Africa. Normalised volatility measures the volatility of stock returns with the event window in relation to volatility outside the event window, and is computed as ((event volatility/normal volatility)-1). Event volatility is computed as the mean absolute market-adjusted abnormal return within the event window. For an -10,+10 event window, event volatility is computed as. Normal volatility is computed as the mean absolute market-adjusted abnormal return for the 60 days before the start of the event window and 60 days after the end of the event window. For a -10, 10 event window, normal volatility is computed as. Panel A presents results for all earnings, Panel B for positive earnings and Panel C for negative earnings. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

Panel A: Full Sample

Event Window	Pre-IFRS		Post-IFRS	
	Nigeria	South Africa	Nigeria	South Africa
(-10,+10)	0.052*	0.028**	0.157***	-0.001
(-10,-3)	-0.009	0.028	-0.019	0.034
(-2,+2)	0.023	0.007	0.308***	-0.030
(-1,+1)	0.028	0.027	0.418***	-0.025
(-1,0)	0.018	0.007	0.375***	-0.071**
0	0.089	0.037	0.664***	-0.021
(0,+1)	0.067	0.052	0.587***	0.023
(0,+3)	0.049	0.014	0.424***	0.019
(+3,+10)	0.141***	0.068***	0.248***	0.009

Panel B: Good News

Event Window	Pre-IFRS		Post-IFRS	
	Nigeria	South Africa	Nigeria	South Africa
(-10,+10)	0.058*	0.025***	0.165***	-0.008
(-10,-3)	-0.006	0.022*	-0.003	0.014
(-2,+2)	0.026	0.014	0.341***	-0.015
(-1,+1)	0.029	0.028	0.451***	-0.018
0	0.109	0.046	0.690***	-0.002
(-1,0)	0.022	0.010	0.403***	-0.057
(0,+1)	0.075	0.055**	0.621***	0.029
(0,+3)	0.056	0.017	0.455***	0.029
(+3,+10)	0.147***	0.066***	0.234***	0.002

Panel C: Bad News

Event Window	Pre-IFRS		Post-IFRS	
	Nigeria	South Africa	Nigeria	South Africa
(-10,+10)	0.000	0.056	0.007	0.044
(-10,-3)	-0.078	0.081	-0.282	0.161
(-2,+2)	0.020	-0.053	-0.242**	-0.126
(-1,+1)	0.017	0.019	-0.128	-0.070
(-1,0)	-0.019	-0.026	-0.095	-0.156*
0	-0.064	-0.046	0.225	-0.137
(0,+1)	0.007	0.031	0.019	-0.017
(0,+3)	0.029	-0.016	-0.101	-0.045
(+3,+10)	0.107	0.091	0.480	0.055

In South Africa, average normalised volatility for the main event window (-10, +10) in the Pre-IFRS period is 0.028 but -0.001 in the Post-IFRS period. Thus, not only is normalised volatility greater in the Pre- mandatory IFRS period than in the Post-mandatory IFRS period, but the table also shows that earnings in the post-mandatory period for the main event window are not informative, given the negative sign of the normalised volatility figure. Consistent with the results for the main event window, normalised volatility in the other windows are also greater in the Pre-IFRS period than in Post-IFRS period. For both good and bad news, a similar pattern to the full sample is observed.

Overall, the findings in Table 7.1 show that the debate about whether the adoption of IFRS improves the information environment of firms, and by extension, the functioning of capital markets, may be genuine and not far from over. However, given that most previous studies of the capital market benefits of IFRS adoption use cross-country samples (eg. Daske et al. 2008, Landsman et al. 2012), the differences in the impact of IFRS on a firm's information environment can be due to country-specific factors. The next section discusses results from the multivariate analysis where the impact of mandatory IFRS adoption on CAR and ATV is analysed.

7.4.2 Impact of IFRS adoption on CARs and ATV

Results from the estimations of the impact of IFRS adoption on *CAR* and *ATV* are presented in Table 7.2 and 7.3 for Nigeria and South Africa respectively. As already mentioned, IFRS is an indicator variable which takes the value of 1 for years after the mandatory adoption of IFRS in each country (2013-2015) and zero otherwise. Interestingly, the regression results in Table 7.2 do not show any statistically significant impact of IFRS on both CAR and ATV, although the coefficients are generally positive. This insignificant effect is still observed when the IFRS dummy is interacted with earnings characteristics notably Earnings and Earnings Growth.

The results presented in Table 7.3 for South Africa also do not appear different to those for the Nigerian sample. The impact of IFRS is generally insignificant except for a weakly significant impact in models 6 and 7. Again, interacting the IFRS dummy with earnings characteristics do not also lead to any significant impact on either CAR or ATV.

This provides support for Hypothesis 11, that the market reaction to earnings did not improve significantly following the mandatory adoption of IFRS.

The results from the regressions presented in Tables 7.2 and 7.3 are consistent with the view that financial reporting outcomes of IFRS adoption is greater in countries with stronger enforcement of laws (Daske et al. 2008, Landsman et al. 2012, Houqe et al. 2012). These studies combine samples from different countries and find that although the adoption of IFRS has statistically significant positive effects, these effects may vary depending on the strength of legal enforcement of regulations. For example, Landsman et al (2012) arrive at this conclusion by interacting their IFRS dummy with another dummy which indicates whether countries in their sample have above median level of enforcement in the rule of law index constructed by Mastruzzi et al. (2007). Therefore, the approach in this Chapter, to focus on countries individually, provides evidence in support of this view as the two countries in question are associated with weaker enforcement of laws compared to more developed countries like the US, UK and countries in the European Union.

Indeed, Holthausen (2009) argues that the goal of having a credible and uniform set of accounting standards, which standards like the IFRS seek to achieve, may not be realised if underlying institutional and economic factors within countries do not improve. Using a sample of 26 countries around the world, Daske et al. (2008) find that the capital market benefits of the adoption of IFRS are more pronounced in countries where there have been simultaneous efforts to improve governance and enforcement of regulations and where firms have a greater incentive to be transparent. Such arguments are consistent with studies which have concluded that perhaps the improvement in accounting standards alone is not a sufficient condition to improve financial reporting outcomes and its consequent impact.

As identified in Chapter 2 of this thesis, although most African countries have developed corporate governance codes and pieces of legislation, the problem of enforcement yet remains the biggest challenge. Some of the factors already identified include inadequate resourcing of state institutions mandated to enforce this regulations as well as a general lack of will by the political establishments. The findings presented in Tables 7.2 and 7.3 therefore provide some further evidence to suggest that the regulatory environment, especially with respect to enforcement in African markets, would have to be improved if the capital market benefits of IFRS adoption are to be fully realised.

Table 7.2: IFRS adoption and earnings reactions in Nigeria

This table presents regression results on the impact of IFRS adoption on market reactions to earnings in Nigeria. IFRS is an indicator variable which takes the value of 1 for a year relating to the post-IFRS adoption period (2013-2015) and 0 otherwise. All other variables are as defined in chapter 6 *T*-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	CAR				ATV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IFRS	0.0109	0.0149	0.0330	0.0435	-0.0010	0.0749	0.2321	0.2927
	(0.25)	(0.34)	(0.78)	(1.05)	(-0.00)	(0.09)	(0.27)	(0.35)
Earnings	0.5539**			0.9912***				
	(2.26)			(2.75)				
Earnings Growth		0.1660		-0.1062				
		(0.93)		(-0.70)				
|Earnings|					6.5974***			7.6655
					(2.90)			(1.61)
|Earnings Growth|						4.2077**		2.4414
						(2.62)		(1.08)
Positive to Negative			0.0237				0.5600	
			(0.42)				(0.94)	
Negative to Positive			0.0018				-0.1946	
			(0.04)				(-0.71)	
IFRS x Earnings				-0.9973**				
				(-2.61)				
IFRS x Earnings Growth				0.4160				
				(0.53)				
IFRS x |Earnings|								-5.7448
								(-0.99)
IFRS x |Earnings Growth|								-1.4631
								(-0.35)

Continued on next page

Table 7.2 continued

	CAR				ATV			
Firm Size	-0.0041	-0.0002	0.0015	-0.0055	-0.0828	-0.0682	-0.0289	-0.1026
	(-0.34)	(-0.02)	(0.12)	(-0.45)	(-0.96)	(-0.62)	(-0.29)	(-1.02)
Leverage	0.1852*	0.1219	0.1273	0.1508	0.0270	-0.8132	-0.6156	-0.4557
	(1.68)	(1.29)	(1.43)	(1.28)	(0.04)	(-0.96)	(-0.77)	(-0.58)
Age	0.0146	0.0161	-0.0069	0.0205	0.0499	0.0826	-0.2199	0.0872
	(0.27)	(0.30)	(-0.14)	(0.41)	(0.05)	(0.08)	(-0.21)	(0.09)
Trading Frequency	-0.0183	-0.0180	-0.0159	-0.0175	-0.1167	-0.2004	-0.1040	-0.1901
	(-0.43)	(-0.42)	(-0.41)	(-0.38)	(-0.36)	(-0.53)	(-0.30)	(-0.51)
Synchronicity	-0.0023	-0.0163	-0.0262	0.0205	0.5970	0.6373	0.2693	0.8472
	(-0.02)	(-0.17)	(-0.27)	(0.20)	(0.90)	(0.93)	(0.41)	(1.18)
Reporting Lag	0.0000	0.0000	-0.0000	0.0001	-0.0020	-0.0022	-0.0025	-0.0020
	(0.21)	(0.21)	(-0.05)	(0.44)	(-1.04)	(-1.19)	(-1.25)	(-1.16)
Constant	-0.0014	0.0148	0.0324	-0.0260	1.0940	1.3750	1.5365	1.0742
	(-0.01)	(0.14)	(0.36)	(-0.26)	(1.01)	(1.12)	(1.19)	(0.96)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	122	122	122	122	122	122	122	122
R^2	0.147	0.126	0.123	0.196	0.124	0.111	0.094	0.159

Table 7.3: IFRS adoption and earnings reactions in South Africa

This table presents regression results on the impact of IFRS adoption on market reactions to earnings in South Africa. IFRS is an indicator variable which takes the value of 1 for a year relating to the post-IFRS adoption period (2013-2015) and 0 otherwise. All other variables are as defined in chapter 6 *T*-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	CAR				ATV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IFRS	-0.0029	-0.0031	-0.0039	0.0001	0.0937	0.1031*	0.0976*	0.1047
	(-0.33)	(-0.37)	(-0.46)	(0.00)	(1.61)	(1.76)	(1.70)	(1.15)
Earnings	0.0027			-0.0389				
	(0.06)			(-0.70)				
Earnings Growth		0.0547		0.0666				
		(1.47)		(1.32)				
|Earnings|					-0.4881**			-0.5940**
					(-2.39)			(-2.17)
|Earnings Growth|						0.0460		0.2356
						(0.25)		(1.05)
Positive to Negative			0.0044				-0.0052	
			(0.23)				(-0.06)	
Negative to Positive			0.0366**				0.2115	
			(2.02)				(1.28)	
IFRS x Earnings				-0.0606				
				(-0.55)				
IFRS x Earnings Growth				0.0716				
				(0.77)				
IFRS x |Earnings|								-0.3206
								(-0.45)
IFRS x |Earnings Growth|								0.3985
								(0.50)

Continued on next page

Table 7.3 continued

	CAR				ATV			
Firm Size	-0.0032	-0.0029	-0.0017	-0.0018	-0.0468*	-0.0422*	-0.0355	-0.0398
	(-0.84)	(-0.77)	(-0.44)	(-0.46)	(-1.81)	(-1.72)	(-1.51)	(-1.63)
Leverage	0.0096	0.0124	0.0091	0.0071	-0.2301	-0.2329	-0.2288	-0.2313
	(0.53)	(0.68)	(0.48)	(0.38)	(-1.54)	(-1.56)	(-1.50)	(-1.54)
Age	0.0025	0.0019	0.0014	0.0010	-0.0219	-0.0180	-0.0230	-0.0253
	(0.47)	(0.38)	(0.27)	(0.18)	(-0.53)	(-0.44)	(-0.56)	(-0.61)
Trading Frequency	-0.0222*	-0.0206*	-0.0221*	-0.0209*	0.0379	0.0347	0.0383	0.0277
	(-1.89)	(-1.79)	(-1.88)	(-1.79)	(0.53)	(0.48)	(0.54)	(0.38)
Synchronicity	0.0541	0.0512	0.0494	0.0487	-0.1706	-0.1992	-0.2258	-0.1781
	(1.42)	(1.36)	(1.29)	(1.27)	(-0.78)	(-0.92)	(-1.04)	(-0.81)
Reporting Lag	-0.0001	-0.0001	-0.0001	-0.0001	-0.0012	-0.0012	-0.0010	-0.0012
	(-0.57)	(-0.56)	(-0.42)	(-0.56)	(-0.89)	(-0.90)	(-0.74)	(-0.86)
Constant	0.0285	0.0255	0.0176	0.0258	1.9046***	1.8149***	1.7635***	1.8668***
	(0.87)	(0.78)	(0.53)	(0.79)	(6.98)	(7.01)	(6.78)	(6.99)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1141	1141	1141	1141	1141	1141	1141	1141
R^2	0.022	0.026	0.026	0.028	0.026	0.023	0.026	0.028

7.4.3 Corruption and earnings informativeness

This section presents results from analysis of the effect of perception of corruption on the market reactions to earnings. Summary statistics *Corruption* and *Auditing and Reporting Standards* are presented in Table 7.4.[15] Kenya has the highest mean value of *Corruption* of 0.432 with South Africa having the lowest of 0.221. With respect to the Auditing and Reporting Standards, South Africa has the highest of 6.38 with Nigeria having the lowest of 3.91. The average value for Kenya over the period is 4.60.

Table 7.4: Summary statistics of corruption and auditing and reporting standards

This table presents summary statistics of institutional variables: Corruption is the inverse of transparency international index score on the perceptions of corruption. Auditing and Reporting is a country's average score in the Global Competitiveness

	Mean	Median
Corruption		
Kenya	0.432	0.455
Nigeria	0.398	0.400
South Africa	0.221	0.222
Auditing and Reporting Standards		
Kenya	4.601	4.665
Nigeria	3.912	3.944
South Africa	6.380	6.300

Regression results from the impact of the perception of corruption on the market reaction to earnings are presented in Table 7.5. In columns (1) and (2) the dependent variable is CAR, which represents a price reaction to earnings news. In columns (3) and (4) the dependent variable is ATV. The main measure of corruption is the inverse value of the Transparency International Corruption Score. For robustness purposes, another proxy for corruption is used in columns (2) and (4), the International Country Risk Guide Corruption Index. This corruption index is produced by the PRS Group, one of the world's leading providers of country risk information. Their corruption index is a component of a comprehensive analysis of financial, economic and political risk in countries around the world. Corruption is found to have no statistically significant impact on CARs, implying that the price reaction to earnings announcements by firms in a

[15] Summary statistics are presented for only these variables because those of other variables are the same as that which has been presented in Chapter 6 of this thesis. Appendix 7.1 of this chapter, however, presents a correlation matrix for all the variable used.

country is not influenced by the level of corruption. However, in columns (3), where the dependent variable is ATV, corruption has a negative and significant impact, suggesting that investors react less to earnings announcements in countries where corruption is higher. Given that trading volume is a reflection of the direct actions of investors around the release of corporate information (Kim and Verrecchia 1991), the results in Table 7.5 provide support for Hypothesis 12 that the market reactions to earnings announcements can be influenced by the perceptions of corruption. This finding on ATV is not only statistically significant but economically meaningful. In column (3) for example, the coefficient of -3.15 suggests that all other things equal, a one standard deviation increase in the perception of corruption decreases abnormal trading volume by 0.28 corresponding to about 22% of the sample median.[16]

Reduced trading volume and lack of price informativeness associated with corruption in Table 7.5 support the general notion that country legal and political factors have an impact on capital markets via investor participation and information risk (Eleswarapu and Venkataraman 2006). In their study, they find that trading cost is usually higher in countries with weaker judicial efficiency. A major reason for this assessment lies in the fact that rules (and the enforcement thereof) governing corporate disclosures have implications for information transmission and how such information is acted upon. Moreover, from an investor protection perspective and as argued by La Porta et al. (1998), legal rules which are meant to protect investors from expropriation and the confidence that they will be enforced can influence the willingness of investors to participate in financial markets. The prevalence of corruption implies that such laws, if in existence, might not be enforced, and can therefore adversely affect the value investors attach to corporate information including earnings. But earnings will be more informative if the perception of corruption is lower.

General corruption at the country level could also serve as a fertile ground for firm-level corruption to thrive (Alm et al. 2016). Thus, firms in more corrupt countries are more likely to have a greater corruption culture. Liu (2016) finds that firms with greater corruption culture are more likely to engage in earnings management and other accounting misconduct. A natural consequence of this is for investors to be skeptical about, and act less on accounting information whenever they are announced (Marquardt

[16] The standard deviation of the Corruption variable for all three countries is 0.089. Therefore multiplying this by the coefficient of -3.15 gives -0.28. This corresponds to 22% of the median value of ATV for all three countries, which is 1.272

and Wiedman 2004). Interestingly, Liu (2016) constructs a firm level proxy for corruption based on the Transparency International Index scores of countries from where leaders of these firms immigrated. This provides further evidence that country corruption has implications for firm-level corruption which can ultimately affect investors' attitudes towards corporate information such as earnings. A related study conducted by Fan et al. (2014) in China, shows that firms linked to some 45 top bureaucrats involved in corruption scandals were associated with lower earnings informativeness.

Overall the results in Table 7.5 provide some evidence that corruption can influence how investors react to corporate information. The perceived credibility of accounting information is a major determinant of the market's reaction to its release (Pevzner et al. 2015). Investors are therefore most likely to assign a higher probability to manipulation of financial results or managers behaving opportunistically in countries with higher levels of corruption and accordingly react less to corporate earnings announcements. Moreover, Donadelli et al. (2014) posit that corruption has the potential to worsen the problem of agency conflicts leading to poor corporate governance. For instance, they argue that managers in corrupt environments are likely to exploit resources of the firm to pay officials for personal gain. Poor corporate governance has, however, been found to affect the informativeness of earnings negatively and this relationship appears to be pronounced in countries with less transparent information environment (Lau et al. 2016). The results in this chapter indicate that corruption does play a role in the governance and investor protection framework, particularly for African countries, where this has been shown to be prevalent as indicated in Chapter 2 of this thesis.

Table 7.5: Corruption and market reaction to earnings announcements

This table presents regression results on the impact of perceptions of corruption on market reactions to earnings. Corruption is the inverse of transparency international index score on the perceptions of corruption. Audting and Reporting standards is a country's average score in the Global. All other variables are as defined in chapter 6 *T*-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	CAR				ATV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Corruption	-0.0246		0.1924		-3.1525**		-1.6449	
	(-0.12)		(0.97)		(-2.16)		(-1.55)	
Corruption(ICRG)		0.0053		0.0026		-0.2120*		-0.2112**
		(0.31)		(0.19)		(-1.68)		(-2.00)
Auditing and Reporting Standards	0.0531	0.0468	-0.0325	-0.0029	0.4757	0.2939	0.2072	0.1737
	(1.46)	(1.42)	(-1.53)	(-0.16)	(1.52)	(1.07)	(1.63)	(1.37)
Earnings	-0.0020	-0.0010	-0.0507	-0.0051				
	(-0.03)	(-0.02)	(-0.54)	(-0.08)				
Earnings Growth	0.0305	0.0304	0.0288	0.0239				
	(0.56)	(0.56)	(0.44)	(0.44)				
|Earnings|					-0.3644	-0.3694	-0.3903	-0.3535
					(-1.21)	(-1.22)	(-1.32)	(-1.19)
|Earnings Growth|					0.4115	0.4116	0.3626	0.3568
					(1.49)	(1.49)	(1.33)	(1.31)
Positive to Negative	-0.0093	-0.0094	0.0134	-0.0088	-0.0133	-0.0164	0.0109	0.0059
	(-0.54)	(-0.54)	(0.57)	(-0.51)	(-0.13)	(-0.15)	(0.10)	(0.06)
Negative to Positive	0.0144	0.0140	0.0031	0.0155	0.2047	0.1975	0.1712	0.1635
	(0.71)	(0.69)	(0.11)	(0.76)	(1.37)	(1.32)	(1.14)	(1.09)

Continued on next page

Table 7.5 continued

	CAR				ATV			
Firm Size	-0.0031	-0.0033	-0.0051	-0.0021	-0.0376*	-0.0409*	-0.0337	-0.0347
	(-0.90)	(-0.94)	(-0.74)	(-0.63)	(-1.67)	(-1.82)	(-1.48)	(-1.53)
Leverage	0.0095	0.0096	0.0269	0.0072	-0.1517	-0.1560	-0.1596	-0.1544
	(0.48)	(0.49)	(1.31)	(0.36)	(-1.02)	(-1.05)	(-1.06)	(-1.03)
Age	0.0033	0.0034	0.0154**	0.0030	-0.0328	-0.0305	-0.0340	-0.0318
	(0.57)	(0.58)	(2.28)	(0.51)	(-0.84)	(-0.79)	(-0.88)	(-0.83)
Trading Frequency	-0.0296**	-0.0297**	-0.0228	-0.0250**	-0.0726	-0.0646	-0.0278	-0.0160
	(-2.47)	(-2.48)	(-1.60)	(-2.18)	(-0.95)	(-0.84)	(-0.39)	(-0.22)
Synchronicity	0.0575*	0.0592*	0.0287	0.0445	0.0403	0.0698	-0.0755	-0.0865
	(1.77)	(1.83)	(0.72)	(1.44)	(0.19)	(0.32)	(-0.36)	(-0.41)
Reporting Lag	-0.0001	-0.0001	0.0000	-0.0000	-0.0013	-0.0014	-0.0014	-0.0014
	(-0.55)	(-0.55)	(0.09)	(-0.25)	(-1.45)	(-1.48)	(-1.43)	(-1.47)
Constant	-0.3012	-0.2693	0.2113	0.0736	-0.3859	0.2374	1.1580	1.1052
	(-1.37)	(-1.25)	(1.52)	(0.63)	(-0.21)	(0.14)	(1.31)	(1.27)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	No	No	Yes	Yes	No	No
Obs	1283	1283	1283	1283	1283	1283	1283	1283
R^2	0.036	0.036	0.032	0.018	0.042	0.041	0.031	0.032

7.4.4 The interaction of IFRS and perception of corruption

To determine whether the mandatory introduction of IFRS has any moderating effect on the impact of corruption, the IFRS variable is interacted with the corruption variable. Marra et al. (2011) argue that the adoption of IFRS helps to enhance corporate governance. They make this conclusion by analysing the effect of two governance structures— board independence and audit committee on the earnings management. If the adoption of IFRS can be indicative of good governance, then in a setting where corruption is highly prevalent, the implementation of IFRS could moderate the adverse impact of corruption. Thus, there should be no statistical significance of the interaction term between IFRS and corruption. Table 7.6 presents estimates of the regression results including the interaction term between IFRS and the two measures of corruption. The stand-alone variables for corruption becomes insignificant for ATV. Also the interaction term for IFRS and Corruption, is insignificant, providing support for the assertion that the negative impact of corruption on the market reaction to earnings announcements can be reduced when the accounting and regulatory framework is enhanced. The results from this table also provides evidence in support of the earlier arguments that IFRS will not have capital markets benefits when there is weak enforcement of laws and regulations.

Table 7.6: Corruption, IFRS adoption and market reactions to earnings

This table presents regression results on the moderating effect IFRS has on the impact of perceptions of corruption on market reactions to earnings. Corruption is the inverse of transparency international index score on the perceptions of corruption. Audting and Reporting standards is a country's average score in the Global Competitiveness IFRS is an indicator variable which takes the value for a year relating to the post-IFRS adoption period (2013-2015) and 0 otherwise. All other variables are as defined in chapter 6 *T*-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively

	CAR		ATV	
	(1)	(2)	(3)	(4)
Corruption	0.2802		-0.6536	
	(1.27)		(-0.46)	
Corruption (ICRG)		-0.2953**		-0.4362
		(-2.14)		(-0.42)
IFRS	-0.0692	-0.0398	0.0735	0.0709
	(-1.62)	(-0.94)	(0.22)	(0.22)
Corruption x IFRS	0.2201		0.1146	
	(1.36)		(0.09)	
Corruption(ICRG) x IFRS		0.1202		0.0782
		(1.31)		(0.11)
Auditing and Reporting Standards	0.0333**	-0.0150	-0.0084	-0.0131
	(2.15)	(-0.90)	(-0.07)	(-0.12)
Earnings	0.0034	-0.0065		
	(0.05)	(-0.10)		
Earnings Growth	0.0300	0.0341		
	(0.56)	(0.63)		
|Earnings|			-0.5264*	-0.5098*
			(-1.76)	(-1.68)
|Earnings Growth|			0.4212	0.4220
			(1.52)	(1.52)
Positive to Negative	0.0061	0.0074	-0.0116	-0.0141
	(0.32)	(0.38)	(-0.11)	(-0.13)
Negative to Positive	0.0156	0.0155	0.1006	0.0945
	(0.72)	(0.72)	(0.64)	(0.60)
Firm Size	-0.0010	0.0004	-0.0317	-0.0319
	(-0.25)	(0.10)	(-1.32)	(-1.33)
Leverage	0.0258	0.0255	-0.2208	-0.2170
	(1.18)	(1.17)	(-1.41)	(-1.39)
Age	0.0010	0.0009	-0.0520	-0.0517
	(0.15)	(0.15)	(-1.21)	(-1.20)
Trading Frequency	-0.0140	-0.0172	-0.0148	-0.0114
	(-1.09)	(-1.37)	(-0.18)	(-0.15)
Synchronicity	0.0291	0.0172	-0.0734	-0.0814
	(0.84)	(0.48)	(-0.34)	(-0.37)
Reporting Lag	0.0001	0.0001	-0.0017	-0.0017
	(0.26)	(0.28)	(-1.50)	(-1.51)
Constant	-0.3766**	0.0986	1.6692	1.7113
	(-2.05)	(0.49)	(1.60)	(1.62)
Industry Effect	Yes	Yes	Yes	Yes
Obs	1098	1098	1098	1098
R^2	0.017	0.019	0.028	0.028

7.5 Additional analyses and robustness tests

A series of robustness tests are undertaken and the results are presented in Tables 7.7 to 7.9. These relate to the impact of IFRS adoption on the market reaction to earnings announcements. Table 7.7 presents regression results where the dependent variable is Differenced Abnormal Returns (DARs). As defined in Chapter 6, DARs are the average abnormal returns during the event window minus the average abnormal returns in a period outside the event window. The results from this table confirm those in Tables 7.2 and 7.3 as the IFRS dummy still remains statistically insignificant. Table 7.8 and 7.9 use an alternative dummy variable to capture the mandatory adoption of IFRS in both Nigeria and South Africa. Since the mandatory adoption occurred in 2012, it is likely that some earnings reported 2013 will have been prepared using the previous local standards. In order to address this concern, the IFRS dummy is reconstructed where it takes the value of one for 2014-2015 and 0 otherwise. The results presented in the respective tables for each country continue to show that the impact of IFRS has no significant impact on the market reactions to earnings.

Table 7.7 IFRS and Differenced Abnormal Returns

This table presents regression results on the impact of IFRS adoption on market reactions to earnings. The dependent variable is Differenced Abnormal Returns (DAR). IFRS is an indicator variable which takes the value of 1 for a year relating to the post-IFRS adoption period (2013-2015) and 0 otherwise. All other variables are as defined in chapter 6 *T*-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	Nigeria				South Africa			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IFRS	0.0005	0.0002	0.0010	0.0015	-0.0004	-0.0004	-0.0004	-0.0001
	(0.22)	(0.09)	(0.50)	(0.87)	(-0.92)	(-0.99)	(-1.00)	(-0.14)
Earnings	0.0266**			0.0418***	0.0014			0.0004
	(2.46)			(2.74)	(0.82)			(0.17)
Earnings Growth		0.0147*		0.0065		0.0023*		0.0021
		(1.68)		(0.98)		(1.79)		(1.20)
Positive to Negative			0.0000				-0.0002	
			(0.01)				(-0.26)	
Negative to Positive			0.0009				0.0010	
			(0.39)				(1.33)	
IFRS x Earnings				-0.0461***				-0.0048
				(-2.72)				(-0.97)
IFRS x Earnings Growth				-0.0034				0.0032
				(-0.13)				(0.74)
Firm Size	-0.0000	0.0001	0.0002	-0.0001	0.0001	0.0001	0.0001	0.0001
	(-0.06)	(0.21)	(0.43)	(-0.23)	(0.51)	(0.75)	(0.83)	(0.81)
Leverage	0.0107**	0.0074*	0.0081*	0.0082*	0.0007	0.0007	0.0006	0.0006
	(2.24)	(1.72)	(1.94)	(1.77)	(0.86)	(0.78)	(0.67)	(0.75)

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Table 7.7 continued

	Nigeria				South Africa			
Age	-0.0003	0.0004	-0.0007	0.0006	0.0001	0.0000	0.0000	-0.0000
	(-0.14)	(0.16)	(-0.28)	(0.27)	(0.22)	(0.04)	(0.04)	(-0.00)
Trading Frequency	-0.0004	-0.0005	-0.0003	-0.0007	-0.0007	-0.0006	-0.0007	-0.0007
	(-0.22)	(-0.31)	(-0.16)	(-0.37)	(-1.41)	(-1.31)	(-1.39)	(-1.34)
Synchronicity	-0.0012	-0.0015	-0.0020	0.0001	-0.0009	-0.0011	-0.0011	-0.0011
	(-0.26)	(-0.34)	(-0.44)	(0.02)	(-0.51)	(-0.60)	(-0.61)	(-0.61)
Reporting Lag	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
	(-0.46)	(-0.36)	(-0.54)	(-0.12)	(-0.42)	(-0.44)	(-0.34)	(-0.40)
Constant	0.0027	0.0032	0.0034	0.0013	-0.0001	-0.0001	-0.0003	-0.0002
	(0.58)	(0.72)	(0.83)	(0.30)	(-0.04)	(-0.08)	(-0.18)	(-0.12)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	122	122	122	122	1141	1141	1141	1141
R^2	0.132	0.122	0.104	0.189	0.015	0.017	0.016	0.018

Table 7.8: Alternative dummy for IFRS- Nigeria

This table presents regression results on the impact of IFRS adoption on market reactions to earnings in Nigeria. IFRS is an indicator variable which takes the value of 1 for a year relating to the post-IFRS adoption period (2014-2015) and 0 otherwise. All other variables are as defined in chapter 6 *T*-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	CAR				ATV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IFRS	-0.0570	-0.0592	-0.0527	-0.0306	-0.0836	-0.0747	-0.0372	-0.0781
	(-1.36)	(-1.35)	(-1.26)	(-0.62)	(-0.17)	(-0.15)	(-0.08)	(-0.14)
Earnings	0.5888**			0.7162**				
	(2.45)			(2.45)				
Earnings Growth		0.2247		0.0249				
		(1.28)		(0.11)				
|Earnings|					6.6096***			4.7892**
					(2.90)			(2.04)
|Earnings Growth|						4.1857**		2.8653
						(2.50)		(1.54)
Positive to Negative			0.0110				0.5024	
			(0.19)				(0.85)	
Negative to Positive			0.0054				-0.1697	
			(0.10)				(-0.73)	
IFRS x Earnings				-0.6746*				
				(-1.84)				
IFRS x Earnings Growth				0.1341				
				(0.21)				
IFRS x |Earnings|								1.1798
								(0.28)
IFRS x |Earnings Growth|								-3.9638
								(-0.71)

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Table 7.8 continued

	CAR				ATV			
Firm Size	-0.0058	-0.0021	-0.0013	-0.0050	-0.0839	-0.0737	-0.0437	-0.0940
	(-0.48)	(-0.17)	(-0.11)	(-0.41)	(-0.84)	(-0.64)	(-0.38)	(-0.90)
Leverage	0.1870*	0.1177	0.1247	0.1592	0.0274	-0.8218	-0.6338	-0.2769
	(1.77)	(1.32)	(1.45)	(1.41)	(0.05)	(-1.02)	(-0.82)	(-0.37)
Age	0.0801*	0.0895*	0.0779*	0.0818*	0.1288	0.2298	0.0575	0.2050
	(1.87)	(1.85)	(1.70)	(1.69)	(0.21)	(0.36)	(0.09)	(0.32)
Trading Frequency	-0.0207	-0.0216	-0.0177	-0.0199	-0.1195	-0.2039	-0.1081	-0.1704
	(-0.50)	(-0.52)	(-0.47)	(-0.45)	(-0.37)	(-0.55)	(-0.31)	(-0.47)
Synchronicity	0.0099	-0.0018	-0.0030	0.0146	0.6040	0.6860	0.4071	0.7188
	(0.11)	(-0.02)	(-0.03)	(0.15)	(0.73)	(0.84)	(0.49)	(0.87)
Reporting Lag	0.0000	0.0000	-0.0000	0.0000	-0.0021	-0.0023	-0.0023	-0.0023
	(0.06)	(0.09)	(-0.07)	(0.17)	(-1.27)	(-1.40)	(-1.37)	(-1.47)
Constant	-0.4163***	-0.4837***	-0.4817***	-0.3956***	1.3025	2.3534**	2.3487**	1.6369
	(-4.75)	(-5.65)	(-6.11)	(-4.84)	(1.30)	(2.08)	(2.03)	(1.60)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	122	122	122	122	122	122	122	122
R^2	0.166	0.146	0.136	0.186	0.124	0.111	0.092	0.139

Table 7.9: Alternative dummy for IFRS- South Africa

This table presents regression results on the impact of IFRS adoption on market reactions to earnings in South Africa. IFRS is an indicator variable which takes the value of 1 for a year relating to the post-IFRS adoption period (2014-2015) and 0 otherwise. All other variables are as defined in chapter 6 *T*-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% respectively.

	CAR				ATV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IFRS	-0.0059	-0.0054	-0.0059	0.0093	0.0873	0.0944	0.0957	0.1206
	(-0.57)	(-0.52)	(-0.57)	(0.58)	(1.26)	(1.35)	(1.37)	(1.38)
Earnings	0.0023			-0.0334				
	(0.05)			(-0.63)				
Earnings Growth		0.0543		0.0672				
		(1.46)		(1.42)				
|Earnings|					-0.5044**			-0.5896**
					(-2.45)			(-2.18)
|Earnings Growth|						0.0384		0.2240
						(0.21)		(1.03)
Positive to Negative			0.0046				-0.0038	
			(0.24)				(-0.04)	
Negative to Positive			0.0362**				0.2208	
			(2.01)				(1.32)	
IFRS x Earnings				-0.2245				
				(-1.22)				
IFRS x Earnings Growth				0.1705				
				(1.02)				
IFRS x |Earnings|								-1.0174
								(-1.39)
IFRS x |Earnings Growth|								1.3461
								(1.02)

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Table 7.9 continued

	CAR				ATV			
Firm Size	-0.0032	-0.0029	-0.0017	-0.0017	-0.0440*	-0.0391	-0.0324	-0.0370
	(-0.82)	(-0.77)	(-0.45)	(-0.43)	(-1.69)	(-1.59)	(-1.35)	(-1.50)
Leverage	0.0098	0.0126	0.0092	0.0071	-0.2268	-0.2292	-0.2262	-0.2281
	(0.55)	(0.69)	(0.49)	(0.39)	(-1.52)	(-1.54)	(-1.49)	(-1.53)
Age	0.0025	0.0020	0.0014	0.0008	-0.0204	-0.0160	-0.0216	-0.0242
	(0.48)	(0.38)	(0.27)	(0.15)	(-0.49)	(-0.39)	(-0.53)	(-0.59)
Trading Frequency	-0.0221*	-0.0204*	-0.0219*	-0.0197*	0.0297	0.0258	0.0299	0.0221
	(-1.88)	(-1.77)	(-1.86)	(-1.71)	(0.42)	(0.36)	(0.42)	(0.30)
Synchronicity	0.0526	0.0502	0.0487	0.0454	-0.1866	-0.2185	-0.2415	-0.1977
	(1.36)	(1.31)	(1.26)	(1.16)	(-0.85)	(-1.00)	(-1.10)	(-0.89)
Reporting Lag	-0.0001	-0.0001	-0.0001	-0.0001	-0.0010	-0.0010	-0.0008	-0.0010
	(-0.60)	(-0.59)	(-0.46)	(-0.61)	(-0.75)	(-0.74)	(-0.59)	(-0.75)
Constant	-0.2716***	-0.2934***	-0.2767***	-0.3000***	1.8807***	1.8188***	1.8075***	1.7709***
	(-8.68)	(-8.84)	(-8.86)	(-8.61)	(9.25)	(8.84)	(9.01)	(8.63)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1141	1141	1141	1141	1141	1141	1141	1141
R^2	0.022	0.026	0.026	0.029	0.025	0.022	0.025	0.028

7.6 Conclusion

The purpose of this chapter is to examine the role of the institutional environment on the stock market reaction to earnings. Specifically, two factors are analysed; improvement in accounting standards through the lens of IFRS adoption and corruption. Analysis of the impact of IFRS show that normalised volatility is greater in the post-IFRS adoption period than in the pre-IFRS adoption period for Nigerian firms but slightly lower in the case of South African firms. Multivariate analyses, however, provide no evidence of the impact of IFRS on either CAR or ATV. Using the Transparency International and International Country Risk Guide corruption indices as proxies for corruption, the chapter also finds that whilst corruption has no impact on the price changes during earnings announcements, it does have a significant negative effect on investors' actions during the announcement window in terms of trading volume. However, the adoption of IFRS, acting as a mechanism for improved financial disclosure and governance has a moderating effect on the adverse impact of corruption perception on earnings informativeness.

This chapter provides new evidence which highlights corruption as an explanatory factor that could account for cross-country variations in earnings informativeness. Although there is a growing literature on how structural and institutional factors affect informativeness, the impact of the perception of corruption as an important factor in developing countries is yet to gain adequate prominence. This chapter attempts to start the process of filling this gap by providing empirical evidence which highlights that, perceptions of corruption, as a structural and institutional factor, can affect the transmission of value-relevant corporate information as well as how this information is acted upon by investors and other market participants.

Overall, the analysis in this chapter highlights the importance of strengthening the financial and institutional framework of countries on the continent. Mechanisms to ensure the quality of financial reporting cannot be instituted in isolation. They must be accompanied by a commensurate effort aimed at improving investor protection and rule of law if capital market benefits are to be realised. Also, the fight against corruption will need to be taken more seriously as its impact on economic growth and development can be manifest through firm level outcomes whereby investors are discouraged from actively participating in the stock market.

Chapter Appendices

Appendix 7.1: Correlations

This table presents the correlation of the variables used in the chapter.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	CAR	1													
2	ATV	0.0529**	1												
3	IFRS	-0.0183	0.0158	1											
4	Corruption	-0.00591	0.0203	-0.00785	1										
5	Audting and Reporting standards	0.0202	-0.0143	0.141***	-0.842***	1									
6	Earnings	0.0282	0.00395	-0.0239*	-0.0176	-0.0144	1								
7	Earnings Growth	0.0216	0.0126	0.00518	0.0207	-0.0241	0.505***	1							
8	Positive to Negative	-0.00602	0.0163	0.00274	-0.00464	0.0219	-0.310***	-0.318***	1						
9	Negative to Positive	0.0154	0.0418*	0.0183	0.0139	0.00336	0.0550***	0.343***	-0.0817***	1					
10	Firm Size	-0.000949	-0.101***	-0.00740	-0.00769	-0.00266	0.309***	0.0425***	-0.157***	-0.139***	1				
11	Leverage	-0.00884	-0.0357	0.0385***	-0.0516***	0.0776***	-0.304***	-0.0418***	0.0749***	0.0569***	-0.182***	1			
12	Age	0.0506**	-0.0134	0.106***	-0.306***	0.545***	0.00856	0.0111	0.00427	0.00612	0.0117	-0.0721***	1		
13	Trading Frequency	-0.0484**	-0.0284	-0.0778***	0.00890	-0.0562**	-0.00632	-0.00623	0.0393	-0.0455*	0.169***	-0.0235	0.0264	1	
14	Synchronicity	0.0118	-0.0764***	0.0215	-0.0146	0.00283	0.110***	0.0109	-0.0830***	-0.0623***	-0.613***	-0.100***	-0.137***	-0.236***	1
15	Reporting Lag	-0.0486**	0.0143	0.147***	0.402***	-0.488***	-0.142***	-0.0160	0.0903***	0.0336	-0.413***	-0.0312	-0.279***	0.0277	-0.201***

Chapter 8

Conclusion

8.1 Introduction

The thesis is motivated by the apparent recent debate about whether stock prices in developing markets are synchronous given that synchronicity can be high in strong information environment (Dasgupta et al. 2010), or low in either a strong or weak information environment (Xing and Anderson 2011). Using African markets as a setting, this thesis addresses three objectives. The first is to determine the level and determinants of stock return synchronicity in stock prices in African markets. The second objective, which emanates from the results of the first empirical analysis, is to investigate as to whether conditional on the level of stock return synchronicity, earnings announcements are informative and whether earnings informativeness is influenced by fundamentals or trading frequency. The third and final objective is to investigate the impact of the mandatory adoption of IFRS and the perception of corruption on the informativeness of earnings. The purpose of this chapter is to present a summary of the main findings from the empirical analyses of the thesis. The implications and limitations of the thesis are also highlighted and suggestions for future research are provided.

8.2 Summary of main findings

Using a sample of five countries namely; Botswana, Ghana, Kenya, Nigeria and South Africa, the first analysis, contained in Chapter 5, investigates the average level of firm stock return synchronicity. In multivariate analyses, the chapter examines the firm characteristics that drive synchronicity of firms and also ascertains whether synchronicity is influenced by ownership structure. The findings in this chapter reveal that firms on average do not exhibit high levels of synchronicity. This finding is consistent with the view that information disclosure in poor information environments leads to greater surprise and will therefore result in the incorporation of such information into stock prices (Dasgupta et al. 2010). However, synchronicity is higher among larger firms as there is a statistically positive relationship between firm size and synchronicity. Large firms may have greater media coverage and a generally better information environment. The market may therefore be able to learn much about upcoming events concerning them and already price these events into stock returns before they occur. Consequently, when these events occur, they reflect little information and will lead to higher synchronicity. The findings in this chapter contribute to the literature on stock return synchronicity by providing

evidence to support the theoretical arguments that contrary to conventional wisdom, stock return synchronicity can be high in more developed markets and low in less developed markets.

The second analysis, contained in Chapter 6, investigates the informativeness of corporate earnings. After demonstrating that stock prices in African markets exhibit an averagely low level of synchronicity, it was imperative to examine the implications of this using actual corporate events. The analysis in this chapter is also motivated by the fact that tests of market efficiency in African markets have mostly been limited to tests of the weak form hypotheses. Given that the earnings report is one of the main sources of communication between managers and investors, a set of earnings announcements are used in this analysis. In both univariate and cross-sectional analysis, the chapter also investigates whether earnings informativeness is driven by trading frequency. The influence of firm fundamentals, in terms of earnings characteristics, are also examined in cross-sectional analyses. The main measure of informativeness is normalised volatility which compares volatility in the event window to volatility in a period outside of the event window. The results indicate that earnings are indeed informative and consistent with the findings of the previous chapter, earnings informativeness have little relationship with synchronicity. However, trading frequency plays an important role in driving earnings informativeness. Notably, less frequently traded stocks are associated with greater earnings informativeness. More highly traded stocks are less associated with earnings informativeness. The cross-sectional tests also show some evidence of the impact of firm fundamentals, in terms of earnings characteristics, and this varies according to the country in question. For abnormal trading volume in Kenya, the magnitude of earnings is a key driver whilst in Nigeria, the magnitude of earnings has an impact on both price and volume reactions. For firms in South Africa, the growth in earnings drives earnings informativeness both in terms of price and volume. Overall, the findings in this chapter provide new evidence on the reaction of stock prices in African markets to corporate information. It also extends the international literature on earnings informativeness and further highlights the role of liquidity in facilitating the ability of stock prices to incorporate firm information.

In the final analysis contained in Chapter 7, the impact of the broader institutional environment on earnings informativeness is examined. Specifically, this chapter investigates the impact of accounting standards through the lens of IFRS adoption. It also

investigates whether earnings informativeness is influenced by perceptions of corruption, which is a major issue of governance for most developing countries, particularly those in Africa. Whilst the impact of perceptions of corruption has been overlooked in the literature, the impact of IFRS adoption has produced mixed results. The findings show that the mandatory adoption of IFRS led to no improvements in the market reaction to earnings. As already mentioned in Chapter 7, this effect in South Africa could also be due to early harmonisation of IFRS with domestic standards. Analysis of the impact of corruption show that the investors trade less in reaction to earnings announcements in situations where perceptions of corruption are high. However, the formal introduction of IFRS has had a moderating effect on this relationship. This Chapter contributes to the growing literature on how structural and institutional factors affect earnings informativeness (eg. DeFond et al. 2007, Griffin et al. 2011, Pevzner et al. 2015) by accounting for the impact of perceptions of corruption, which is a reflection of a country's legal, economic and regulatory environment. The literature on corruption is also extended by showing that it has implications for firm-level outcomes. This also highlights a call to action by regulators and appropriate government agencies to ensure the effective enforcement of final reactions to ensure that investors can continue to have the confidence in and be attracted to invest in the capital markets on the continent.

8.3 Implications

The information efficiency of stock markets is crucial if African markets are to attract new investment. The African continent is increasingly becoming a viable destination for most multinational companies. For example, in January 2018, JP Morgan announced plans to expand their presence into Ghana and Kenya. The continuous attractiveness of African markets as a destination for both foreign direct and portfolio investors needs to be underscored by empirical studies, highlighting the incremental improvements in market efficiency. For markets to play their disciplinary role effectively, corporate information such as earnings should not only be credible but released on a timely basis. The evidence from this thesis points to some informational efficiency in these markets with respect to earnings. Yet institutional mechanisms for improving governance and information disclosure, such as laws and stock exchange regulations, need further strengthening in order that outside investors are protected, and markets become more efficient. Hearn and Piesse (2013), who study governance and liquidity in sub-Saharan Africa, find that liquidity is positively associated with institutional factors such as the

effectiveness of the regulatory systems. The quality of regulatory regimes should be reflected in corporate reporting and insider trading. Further, the quality of news transmission could be enhanced with an emphasis on the use of information systems and technology. Improvement in the quality and quantity of corporate news provision should be considered with particular attention to the role of the regulatory news providers and the quality of financial journalism. Studies in the UK have highlighted the value of corporate news provision (Sheridan et al. 2006).

Further, prior empirical evidence suggests there are potential diversification benefits of including African stocks in portfolios due to the weak stochastic trends between African markets and World Markets (Alagidede 2009). However, there will need to be more empirical studies that help investors better understand the dynamics as well as the informational efficiency of these markets within the context of the different institutional and regulatory environment that firms operate in. Moreover, Ibbotson et al. (2013) argue that liquidity can be an investment style just like size, value/growth or momentum. Therefore, and in line with this argument, the results show that as international investors seek to diversify, stocks in both our high and less traded categories could form the basis for the construction of investment portfolios to take advantage of trading opportunities around such corporate events as earnings announcements.

Finally, this study also shows that there is more work to be done by regulators. There needs to be a sustained effort at ensuring that institutions that are meant to enforce laws are effective and well-resourced. Throughout the world, measures of the perception of corruption have become issues that governments can no longer ignore or take for granted. Whilst the impact of corruption on economic growth are quite well documented, this study further shows that the adverse impact of corruption on economic growth and development can also be manifested through channels that are related to firm-level outcomes. Therefore, the need to reduce corruption, both real and perceived, has to be taken seriously. One way to achieve this is by improving institutional mechanisms of governance and information disclosure such as laws and stock exchange regulations.

8.4 Limitations

Studies of this nature are generally challenging to conduct on African markets due to the unavailability of good quality data. Whilst reasonable steps have been taken to arrive at the best possible sample and to carry out the analysis using the most appropriate methods, this study is still associated with some limitations, many of which have already been discussed in Chapter 4 of the thesis. This section highlights the main limitations inherent in the study and also provides information on the steps taken to minimise their impact on the results.

Firstly, earnings announcement dates were obtained from Datastream, rather than the well-known sources of earnings announcement such as the I/B/E/S. This notwithstanding, efforts were made to confirm the accuracy of these dates. A small sub-sample of earnings report dates, obtained from published reports on the stock exchange websites of some of the countries in the sample, was compared to the dates in Datastream and found to be an exact match. This therefore provides reasonable assurance that the earnings announcements dates used are accurate and reliable. Moreover, the choice of a relatively longer event window of (-10, +10) implies that any reactions around the announcements of earnings will still be captured in the event of a slightly different date to what was obtained from Datastream.

Another limitation may lie in the choice of selecting only five countries for the analysis. As already indicated in Chapters 2 and 5, this choice was motivated mainly by the need to focus on countries where the stock market plays a more prominent role in the financial system. Although it is expected that we can draw insights from this study about African markets in general, the focus of this study is also to gain a better understanding of the individual countries used. Therefore, the issue of selection bias should not be a major concern.

Thirdly, Chapter 5 of this thesis explores the role of ownership structure in explaining synchronicity among firms. Similarly, Chapter 6 also examines whether there are differences in ownership structure between firms in the HTF and MTF categories to help explain variations in earnings informativeness. Whilst the introduction of ownership structure presents an interesting perspective, the lack of sufficient ownership data could limit the robustness of the findings with respect to ownership structure. Again, and as already indicated, many studies argue that developing and emerging markets are

characterised by complex ownership structure such as pyramids and cross-holding. This would have provided a firmer perspective. However, data on these could not be obtained.

Further to the preceding point, one main way of obtaining ownership data and other corporate governance data is to hand collect these directly from the annual reports as done in some previous studies (eg. Ntim 2009, Ntim et al. 2012a, Ntim et al. 2013) However, getting annual reports for all 616 companies proved a serious challenge. But given that one of the sources of Osiris ownership data is the company annual reports itself, this was cross-checked against a few annual reports obtained to assure the accuracy of this data. Thus, inferences and conclusions drawn for analysis involving ownership structure data are appropriate.

Additionally, the main model for computing abnormal returns is the market adjusted model. This model relies on the assumption that the expected return for a stock is the return on the index, which may sound rather too simplistic to some. However, as already demonstrated in Chapter 4, beta and alpha estimates from the more popular market model are inaccurate and problematic to improve, which therefore influenced the decision to maintain the use of the market-adjusted model. Moreover, the main measure of earnings informativeness, normalised volatility, is computed based on market adjusted model abnormal returns (Griffin et al. 2011).

Another limitation lies in the fact that in Chapter 7, the impact of corruption on earnings informativeness is analysed with a combined sample of three countries. This raises some concerns of limited variation due to the small number of countries. Also, as this part of the analysis could not be undertaken on an individual country basis, there is a chance that the results may be driven by the impact of South Africa. However, the findings suggest that this is viable ground for more detailed exploration using more countries on the continent and the possibility of including a sample of developed countries for comparison purposes.

8.5 Suggestions for future research

Based on some of the shortcomings discussed in the previous section, the analyses in this thesis provide avenues for further research. Firstly, given the availability of data, it would be useful to extend the reaction of stock prices to an expanded set of news items. This will help to gain a comprehensive view of which corporate information have pricing

implications for stocks in African markets. Neuhierl et al. (2013), using a sample of US firms, find that stock markets indeed react to a wide variety of news including new products and services, legal developments and management changes. Whilst the infrastructure in more developed markets like the UK will create an enabling environment for investors to react to many kinds of news, this may not be the case for developing markets, particularly those in Africa. However, it would be worthwhile to determine whether aside from more regulatory news items like earnings, investors also pay attention to other types of corporate events.

Secondly, although a justifiable basis has been established in this thesis for focusing on countries that are common law oriented, it would also be useful to undertake a comparative analysis of the impact of synchronicity and stock price informativeness between common law and civil law countries. Finally, given data availability in the near future, more analysis on the impact of ownership structure on earnings informativeness should be carried out especially by investigating more complex ownership structures.

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